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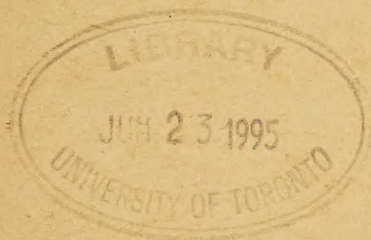
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NATURAL RESOURCES CANADA

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VOL. 8

JANUARY, 1929

No. 1

HON. CHAS. STEWART REVIEWS PROGRESS DURING YEAR 1928

ADVANCES MADE IN MANY
LINES OF ACTIVITY

Development of Our Great Natural Resources
Made Long Strides—Future
is Promising

"The significance of New Year is bound up with the traditions of our race; at this season it is appropriate that we review the achievements of the closing year, take heart from what has been accomplished, and in the light of past experiences set our course for the future.

"The rising tide of prosperity during 1928 has been based on the development of extensive and varied natural resources, and over more than half of the total area of the Dominion these are administered by the departments of the Interior, Mines and Indian Affairs, under my responsibility. In all parts of this great country the pulsations of economic prosperity are being felt as never before.

"At no period in the history of the Dominion has such marked activity been evidenced in the development of our mineral resources. The last few years have witnessed the increasing expansion of the mining and metallurgical industries in the established mineral-producing provinces and the extension of these industries into entirely new areas of undoubted importance and promise. During the same period the standing of Canada among the mineral-producing nations of the world has been considerably enhanced.

"All previous records in mineral production in Canada were surpassed in 1927 when the value of the total mineral output rose to nearly \$250,000,000, and it is more than possible that this impressive total will itself be surpassed when the final figures for 1928 are completed. It is gratifying to note that our mineral output is increasing in variety as well as in quantity and that the list of minerals now produced, both metallic and non-metallic, comprises all of those of outstanding industrial value with a few exceptions only, some of which may yet be mined in the Dominion. Drilling for oil in the western provinces is being attended by very satisfactory results. In Alberta the increasing production has now reached approximately 480,000 barrels of crude naphtha per year. Recent discoveries and developments have attracted world attention to Canada's extensive deposits of copper, nickel, lead and zinc, and to the possibilities of increased production of the precious metals.

(Continued on page 2)



Confederation Park, Ottawa

Canadian citizens, both those acquainted with Ottawa and those who have not yet visited it, have read from time to time in the past year of the improvements which the Dominion Government is making by appropriating property in order to create parks and drives in the heart of the city and to make the surroundings of Parliament Hill worthy of the magnificent buildings of the capital. At the same time it has not been easy for those who have not visited Ottawa in recent months to visualize how far these plans have progressed. To give an idea of this the above aeroplane picture taken late last autumn and slightly modified to show park improvements is published. In the case of changes not yet completed the artist has shown the park spaces as they will be next summer.

Drawing attention to the picture in detail it may be premised that it is taken from the south looking northward. The Parliament Buildings are readily distinguished on their magnificent hill overlooking the Ottawa river, and on the north or Quebec bank is

seen the southern portion of the city of Hull. In the lower right hand corner of the picture will be observed the straight line of the Rideau canal, to the right of it the Union Station, and north of the station the Chateau Laurier hotel. The wide thoroughfare crossing the canal and passing in front of the Parliament Buildings is Wellington street. Just south of Wellington street, where it crosses the canal, is a triangular space with a tall, narrow building across the centre. This building is the Post Office. The first stage of the improvement consisted in expropriating a block of buildings which stood on the space at the west of the Post Office. This was followed by the clearing away of old structures which stood south of this area and along the west side of the canal—where the lawns and curved driveways are shown—to the bottom of the picture. It is in this fine setting that the National Memorial to our fallen heroes is to be located.

These improvements bring the famous Driveway into the heart of the city and to Parliament Hill, greatly bettering traffic conditions and opening up many fine vistas and broad views in the most beautiful part of the capital.

INCREASING HYDRO INSTALLATIONS IN CANADA IN 1928

550,000 HORSE-POWER
ADDED LAST YEAR

Minister of the Interior Issues Annual
Statement on Progress of Power
Development

With world interest centered upon the efforts being put forth in almost every civilized country to secure additional supplies of low-priced power for the needs of industry, the annual review of hydro-electric progress in Canada by the Honourable Charles Stewart, Minister of the Interior, is of timely significance, indicating as it does, that throughout the Dominion the greatest activity prevails in harnessing for industrial, commercial and domestic use the advantageously situated and ample water-power resources of the country.

During the year 1928 the energy of the water-wheels or turbines actually installed and brought into operation amounted to 550,000 horse-power, thus bringing the total for the whole Dominion to 5,328,000 horse-power. In addition to this large increase there are many projects under active construction, some of them nearing completion and others just recently initiated, whose combined installations will result in adding more than 1,200,000 h.p. to the country's total. There are also many projects of magnitude in the formative stage some of which will undoubtedly be undertaken in the near future.

What this great activity means to the prosperity of the country may be gauged from the huge sums of money which must be expended to bring these projects into being and to apply the power to its ultimate uses. For the actual development, transmission, and distribution of the power capacity installed in 1928, together with that now under active construction, it is estimated that not less than \$330,000,000 will be required; while for every dollar expended in power development competent authorities have estimated that six dollars are required in its application. It is necessary, therefore, to visualize the effects throughout the country of the expenditure of an amount reaching, probably, \$2,300,000,000.

With regard to the activities of 1928, although the works of greatest magnitude were in the province of Quebec as has been the case for the past few years, probably the most interesting feature is that practically every province is represented in the year's program. From west to east the major projects were:—

British Columbia.—The West Kootenay Power and Light Company prac-

(Continued on page 3)

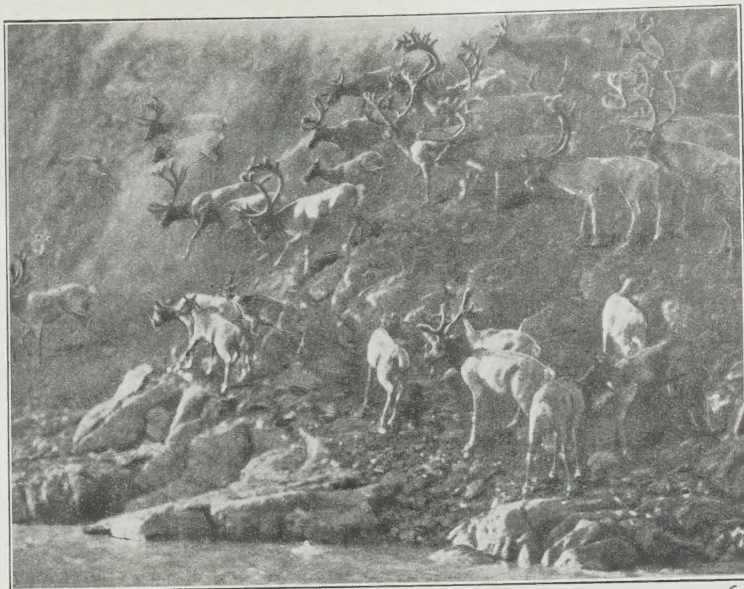
MINING DEVELOPMENT IN NORTHERN MANITOBA

This Area on Eve of Great Expansion—
Progress of Work at Principal Mines

The pre-Cambrian region in northern Manitoba and more particularly that area adjacent to the Saskatchewan boundary now stands on the threshold of a huge mining expansion. With the progress that has been made in railway construction, mine development and exploration, northern Manitoba is now about to take its place among the mineral producers of the Dominion. The major operations are at the Flin Flon and Sherritt-Gordon mines. A part of the Flin Flon's large ore body extends over into Saskatchewan, but the Sherritt-Gordon mine is thirty miles east of the Manitoba-Saskatchewan boundary. Another property, the Mandy Mine, famous for its remarkable shoot of high grade copper ore, which was worked to a depth of 225 feet between 1916 and 1919 and produced over \$2,000,000 worth of copper ore, is located about three miles southeast of the Flin Flon and one mile east of the Saskatchewan boundary. Numerous other properties which are spread over a wide area and which can reasonably be expected to contain the nucleus of valuable mines are being explored and developed by the many mining companies operating in this district. Although no attempt has been made to prove the Flin Flon ore body below 900 feet, it is estimated that there is sufficient ore in sight above this level to keep a 3,000 ton smelter going for twenty years.

Actual construction of this smelter has necessarily been held up during the past season awaiting adequate transportation, but the completion of the Northern Manitoba railway from The Pas to Flin Flon in record time now assures an early start on this large undertaking as well as on the 36,000 horse-power hydro-electric plant at Island Falls seventy-five miles farther north. In the construction of the latter, many thousand tons of freight will have to be hauled more than seventy miles over iced roads by tractors through a veritable wilderness. This freight will include 16,000 tons of cement and fifty or more pieces of machinery ranging from twelve to twenty tons each. Coupled with this huge construction program of smelter and power plant is a 75 mile power transmission line. The draining of a part of Flin Flon lake, in order to mine a part of the ore by open cast, is in itself an engineering feat of considerable magnitude. It is expected that within a few years a town with a population of 5,000 and provided with light, water, and other modern conveniences will have grown up.

In the vicinity of Kississing Lake, the Sherritt-Gordon mines have added greatly to the known mineral resources of this region. A systematic diamond drill campaign has been adding consistently to the known extent of this huge deposit, while an energetic program of development underground has been rapidly placing this property in shape for production. Surface diamond drill results would appear to indicate that the ore zone of this property has a total length of 13,000 feet or two and one half miles. The present under-



Canada's Wild Life in the North—Immense herds of caribou on their autumnal migrations cross the Yukon river close to Dawson city. The above photograph shows part of a herd scrambling up the steep bank after having swum across the Yukon. It is gratifying to note that these herds have greatly increased in numbers compared with fifteen years ago.

Hon. Chas. Stewart Reviews Progress During Year 1928 (Continued from page 1)

These and our established reputation in the production of non-metallic minerals, in addition to petroleum, indicate the importance of the Dominion's mineral wealth and forecast continued prosperity for its mining and allied industries.

"Our well distributed waterways seem to have been placed by Nature where their abundant energy would be most convenient for the development of both primary and secondary industry and for the comfort of urban and rural populations dependent thereon. The past year has witnessed the addition of 550,000 horse-power to our total turbine installation which has now reached the imposing figure of 5,328,000 horse-power, with a further 1,200,000 horse-power of new development in various stages of construction. The outstanding developments have taken place in Quebec, Ontario and Manitoba.

"Our country has been richly endowed with forest resources. The net annual value of the products of our forests reaches about \$475,000,000 and conditions in the lumbering industry are more favourable than for several years. The newsprint industry though suffering from a period of over-production is inherently sound and its leaders are, I am sure, quite capable of mastering the difficulties which temporarily beset them. Optimism must prevail; we are exporting more newsprint than all other countries combined; our plants are newer and equipped with more modern machinery, they have access to cheaper power and more ample pulp-

ground work is being carried on by means of two shafts 7,000 feet apart. The recent announcement of the Canadian National Railways guarantees early rail transportation for this very important and promising property.

In order to lend all possible assistance to the development of the mineral resources of northern Manitoba, the Department of the Interior last summer established an office at The Pas in charge of an experienced mining engineer. This office not only undertakes the supervision of the technical field work in the administration of the mining regulations but through it the Department at Ottawa is brought into close personal contact with the problems of those working in the district.

wood supplies than any of our competitors. These favourable factors must in time bring about the desired result.

"The well being of the Indians and Eskimos is being furthered by every possible means. They are being encouraged in the practice of certain handicrafts similar to those practised by other native races, the aim being to promote health and industry which can only be had by providing convenient opportunity for all to engage in pursuits for which they are adapted by nature. Large areas have been set aside for the benefit of the Indians and Eskimos and careful consideration is being given to the establishment of domesticated reindeer and conservation of musk-ox.

"Tourists holidaying in Canada made expenditures estimated at \$276,000,000, which was well distributed among all classes and added considerably to the general prosperity of 1928. This contribution which our recreational resources make to the national income is, in fact, greater than either the value of our mineral or pulp and paper output. Its influence on the balance of trade and on the financial structure of this young and growing country is enormous.

"On every hand there is just cause for rejoicing and at this season as we find ourselves knocking at the portals of the future we can take confidence in the knowledge that never has a new year opened so auspiciously for Canada, and seldom, if ever, in the history of mankind has a nation of our numbers attained such material prosperity in so short a time or dared to attempt such bold enterprises as we have undertaken."

Western Hemlock in Canada

The western hemlock (*Tsuga heterophylla*) is one of the most important trees in British Columbia in regard to both available supply and production. In a survey of the forest resources of that province the quantity of standing timber of this species was estimated to be 64,000,000,000 feet board measure; of this some 52,000,000,000 feet is located in the coast region. The original virgin supply is almost intact, only a small part having been cut. The cut of western hemlock lumber has for some years averaged about 42,000,000 feet annually, forming about 16 per cent of the total hemlock lumber cut in Canada.

THE THIRD EMPIRE FORESTRY CONFERENCE

Canada Represented at Meetings in
Australia—Much Valuable Infor-
mation Obtained

The good effects which the Empire Forestry conferences are having in securing a stock-taking of the wood capital of the Empire and in bringing out the most successful methods of forest management are becoming increasingly evident. The first conference was held in England in 1920, the second, upon the invitation of Hon. Charles Stewart, Minister of the Interior, was held in Canada in 1923, and the third has just concluded its sessions in Australia and New Zealand. Mr. E. H. Finlayson, Director of Forestry, Department of the Interior, who has recently returned from attendance at this conference, found much in the proceedings that will be of value to Canada and to the other parts of the Empire. As was the case in the previous conferences the meetings were not all held in one place. Thus, starting at Perth in Western Australia, all the states were visited and the stands of timber and methods of lumbering, regeneration, and forestation were carefully studied. The main meetings were held in Canberra, the federal capital.

Australia's native trees are practically all hardwoods, that is broad-leaved trees. This constitutes a distinct contrast to Canada where softwood trees, also called needle-leaved trees, predominate. There are over 400 species of gum tree in Australia and the wood of these trees, although called "hard" ranges from timber as soft as some of our poplars to trees much harder than anything we have in Canada. While many of the gums are used as structural timber, Australia imports a good deal of softwoods from abroad—chiefly from the Pacific coast of North America. In general the same remarks apply to New Zealand. Since there are practically no coniferous trees in Australasia and as trees make rapid growth in the antipodes, both Australia and New Zealand have gone in for planting extensively, using for their operations several of the pines, some Douglas fir, and a limited amount of larch.

Speaking broadly Australia and New Zealand have given more attention to planting than Canada but less to the protection and development of the stands of native trees. The details of forestry problems are very different in Australia from those of Canada or the British Isles but all who took part in the conferences gained much information for use in their homelands. The fact was impressed upon all that the Empire has an adequate supply of hardwoods but that a shortage of softwoods is definitely approaching. As Canada is the Empire's "softwoods storehouse" the duty and opportunity of Canada in this connection are readily seen. Besides the Director of Forestry those who went from Canada to attend the conferences were: Mr. D. Roy Cameron, Associate Director of Forestry, Department of the Interior; Dr. J. M. Swaine, Associate Dominion Entomologist; Mr. E. J. Zavitz, Deputy Minister of Forestry for Ontario, and Mr. P. J. Caverhill, Provincial Forester for British Columbia.

NATURAL RESOURCES CANADA

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HON. CHARLES STEWART,
Minister

W. W. CORY, C.M.G.,
Deputy Minister

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OTTAWA, JANUARY, 1929

Increased Hydro Installations in Canada in 1928

(Continued from page 1)

tically completed its 75,000 h.p. plant at South Slocan, while the British Columbia Power Corporation, through its subsidiaries, brought into operation the 12,500 h.p. Alouette development and advanced the construction of the 300,000 h.p. Bridge River project which is expected to bring 56,000 h.p. into operation in 1931. Other smaller developments were also completed or well advanced.

Alberta.—The Calgary Power Company commenced construction of its 36,000 h.p. Ghost development on the Bow river and extensively added to its transmission system in the southern part of the province.

Saskatchewan.—The Churchill River Power Company commenced work on a 42,000 h.p. development at Island Falls on the Churchill river to supply power to the Flin Flon mine.

Manitoba.—The Manitoba Power Company completed its 168,000 h.p. Great Falls development by adding the final two units of 28,000 h.p. each, while the City of Winnipeg initiated a new 100,000 h.p. plant at Slave Falls and the North Western Power Company one of 225,000 h.p. at Seven Sisters Falls both on the Winnipeg river.

Ontario.—The Hydro-Electric Power Commission brought into operation on October 1 the 220,000-volt transmission line carrying power from the Gattineau river to Toronto and late in November a 110,000-volt line also carrying power from the Gattineau to Ottawa, Smiths Falls and Brockville. The Spruce Falls Company completed its 56,250 h.p. plant at Smoky Falls on the Mattagami river and the Ontario and Minnesota Power Company its 13,200 h.p. development at Calm lake on the Seine river.

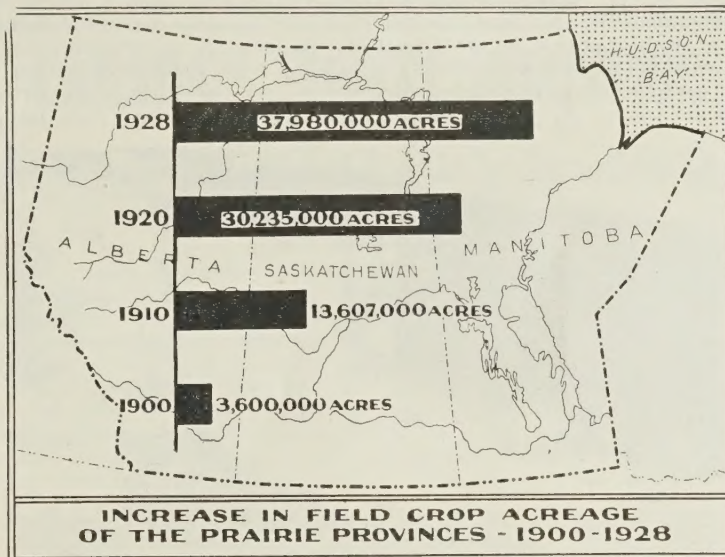
Quebec.—The Gattineau Power Company completed its 204,000 h.p. development at Pagan Falls on the Gattineau river and built transmission lines to connect with those of the Ontario Hydro-Electric Power Commission. The Shawinigan Water & Power Company added a 43,000 h.p. unit at Shawinigan Falls, the Duke Price Power Company a 45,000 h.p. unit at its Isle Maligne station on the Saguenay river, and the Quinze Power Company two 10,000 h.p. units at its Quinze river plant. Among large projects under way are those of the Alcoa Power Company on the Saguenay river, with an initial installation of 260,000 h.p.; and

THE POWER OF WESTERN GROWTH

Contrasted with its spectacular speed in pre-war days, the course of prairie settlement in recent years has seemed slow and subdued. But as a matter of cold fact, despite the absence of sensational features, the expansion of agri-

acreage, on the average, by nearly a million acres annually. Within that eight-year period they have brought into production an added area of roundly 7,700,000 acres.

Obviously, western agricultural advance is fully holding its own in the



culture on the prairies has been plowing ahead with tremendous power. The rate of advance, as indicated by Dominion Bureau of Statistics reports, is little short of amazing. Between 1920 and 1928 Manitoba, Saskatchewan and Alberta have increased their field crop

varied field of Canadian natural resources development. Less in the lime-light and naturally reduced in pace as compared with earlier years of the century, it still ranks and promises long to continue as an unsurpassed factor in the Dominion's economic growth.

a 120,000 h.p. development on the Lievre river by the James MacLaren Company.

New Brunswick.—The Saint John River Power Company brought into operation its Grand Falls plant on October 1 with the first unit of 20,000 h.p., two more units of similar capacity are to follow next year.

Nova Scotia.—The Nova Scotia Power Commission has three power plants under construction on the Mersey river totalling 31,050 h.p. and another on the Tusket river with a capacity of 3,000 h.p.; while during 1928 the Avon River Power Company completed its new 4,350 h.p. plant at Avon River Falls, also one of 500 h.p. on the Fall river.

This necessarily brief review touches only the outstanding projects, but is sufficient to indicate the widespread nature and the magnitude of water-power development throughout the country. A more detailed account will be found in the bulletin issued by the Dominion Water Power and Reclamation Service of the Department of the Interior, Canada.

Value of Prairie Shelterbelts

The Tree Planting Division of the Forest Service, Department of the Interior, reports that there are now about 55,000 flourishing plantations scattered over the Canadian prairies where in former times one could travel for miles without seeing a tree. Besides affording shelter for homesteads and crops and preventing soil-drifting, these plantations have made it possible to establish orchards, vegetable gardens, and plantings of bush fruits such as raspberries and currants, all of which were practically unknown on the prairies a few years ago.

BRITISH WHALERS AND BAFFIN PLACE-NAMES

British ships no longer hunt the whale in Davis strait and Baffin bay, but evidence of their former activity remains in the place-names of the region. According to the Geographic Board of Canada, Adams sound and Arctic bay in Admiralty inlet, Baffin island, commemorate Captain Adams of the Scottish seaport of Dundee on the river Tay, and his ship *Arctic*. There is also an Adams island at the entrance to Navy Board inlet, Baffin island. Eclipse sound at the north end of Baffin island bears the name of another Dundee whaling ship as does Albert harbour. In Eclipse sound are Milne inlet, named after the skipper of the *Eclipse*, and Tay sound. Cape Adams and cape Milne in the Royal Geographical Society group of islands were named by Captain Raold Amundsen in 1905, when he sailed his ship the *Gjoa* through the Northwest passage from the Atlantic to the Pacific, Captains Adams and Milne having deposited stores for him in Melville bay, Greenland.

Antimony in Canada

Although the production of antimony from Canadian mines was first recorded in 1886, shipments have been somewhat erratic and production has gradually fallen off largely on account of the decline in the market price of this metal. Ores of antimony are known to occur, however, in British Columbia, New Brunswick, Nova Scotia, Ontario, Quebec, and Yukon, and there are indications of a renewal of interest which may result in antimony being regularly included in the statistics of Canada's mineral production.

MODIFY CLOSE SEASON ON BEAVER IN NORTH

Indians and Half-breeds in Mackenzie District Permitted to Take Limited Number

Canada's native population in the Far North is dependent on the fur-bearers and other wild animals of that region for supplies of food and clothing. Wild life matters in the Northwest Territories are administered by the Department of the Interior and for a number of years Hon. Charles Stewart, Minister of the Interior, has been following closely the effect that the rapid disappearance of the fauna of the North is having on the welfare of the natives. The introduction of high-powered fire-arms and the constantly increasing demand for furs have been largely responsible for the losses among the more valuable wild life, and the growing scarcity has been a matter of deep concern to the Department.

In recent years there has been more intensive hunting and killing of beaver in the Mackenzie District of the Northwest Territories, and consequently their numbers have been reduced, so much so that early in 1928 it was deemed advisable to declare a close season on beaver to prevent its complete disappearance from the district. Acting on the authority of an Order in Council passed in February, 1928, the Minister of the Interior declared a close season for three years from October 1 of the same year.

During the months of July and August a serious epidemic of influenza broke out among the natives along the Mackenzie river and it was impossible for them to secure the necessary supplies of food and clothing for the on-coming winter. As the beaver is represented as constituting an important factor in the native food supply, Hon. Charles Stewart recommended to the Governor in Council that he be allowed to modify the terms of the close season so that heads of Indian families or half-breed families living as Indians be allowed to trap not more than ten beaver each before May 15, 1929. The recommendation was concurred in and any such Indians or half-breeds may secure their quota anywhere in the Mackenzie District outside of Wood Buffalo park on the southern boundary.

In order that no trafficking in beaver pelts will result from this modification, the pelts must be surrendered to an officer of the Royal Canadian Mounted Police, who is empowered to issue an order on a local trading company for twenty-five dollars worth of supplies for each pelt received. The pelts will be turned over to the Department of the Interior to be disposed of to the best advantage.

After May 15 of this year beaver will be fully protected until October 1, 1931. This respite from the intensive hunting of recent years will undoubtedly be a great aid in re-establishing this valuable fur-bearer with resultant benefits to the natives of the Mackenzie District.

Jasper National Park

Jasper park, which is situated on the Canadian National Railways in the northern part of Alberta, has a total area of 5,380 square miles. A great portion of this huge mountain wilderness is still unexplored. The entire region is rich in historic association.

THE MYSTERY OF MARS IS AN INTRIGUING ONE

Dominion Observatory Studied This Planet During Recent 'Opposition'—Some Interesting Facts

Probably no heavenly body has aroused the interest and imagination of the public at large so much as the planet Mars. Popular interest in this planet has dated from the discovery of the so-called 'canals,' and every twenty-six months, when the earth and Mars approach to within a relatively short distance of each other, this interest wells up anew. At the 1928 'opposition,' as it is called, the closest approach occurred on December 15, at a distance of about 54 million miles. For some considerable time before and after that date the planet was in a favourable position for observation. It is best observed in low latitudes, where it culminates near the zenith. At Ottawa the planet is somewhat too far south for the best conditions, but the Dominion Observatory devoted some time to its study during the recent 'opposition'.

Seen through a powerful telescope under good atmospheric conditions many varied and some puzzling features can be seen by a keen-eyed observer. The most conspicuous of these are the vast 'desert' areas which cover by far the greater part of the planet's surface, and whose reddish-yellow colour gives it its characteristic ruddy hue. Next come the 'blue-green' areas, whose colour is quite probably due to vegetation. These blue-green areas, which belt the planet north and south of the equator, wax and wane in visibility with the martian seasons, changing from a fresh green in the spring to a brownish chocolate in the winter; the analogy with earthly conditions is obvious. It was once thought that these tracts were seas, and they are still sometimes known by that name, though it is now known that there are no large permanent areas of water on Mars. There is also much less atmosphere than on the earth, and comparatively little cloud.

Crossing both deserts and seas, in an apparently geometrical network, lie the 'canals'. This term 'canals' is somewhat unfortunate, and is due to a faulty translation of the Italian word *canali*. Schiaparelli, the discoverer of these markings, took them to be straits, or channels, connecting the seas, and applied the Italian word for such formations to them. The word 'canals' at once brings thoughts of man-made waterways and this, along with the late Professor Lowell's firm conviction that Mars is inhabited by intelligent creatures, has been one of the principal causes of popular interest in this neighbouring world. Professor Lowell's views have made some headway, and it is now generally conceded that, in addition to vegetation, some of the lower forms of animal life may exist; of the possibility of the existence of intelligent beings, however, there is considered to be grave doubt.

The 'canals' are dusky markings about the appearance of which observers are not wholly agreed. Some see them as a geometrical network of extremely narrow and well defined lines, crossing each other at various spots called 'oases', and covering the whole planetary disk; to others again while the pattern is much the same, they appear as hazy streaks. Some observers,

SKI-ING IS POPULAR IN CANADA

Great Outdoor Winter Pastime has Thousands of Devotees Both Young and Old

Ski-ing is undoubtedly Canada's most popular outdoor winter pastime and year by year the number of its devotees steadily grows. Young and old throughout the Dominion now look forward with eagerness to the arrival of the first fall of snow and with only a light covering of a few inches, the skiers are out on the pine-clad slopes,

under are numbered among its devotees. Although all may not become proficient in the art of ski-jumping, and consequently quite a number turn out to watch these displays of skill and daring, there are no spectators at a ski hike or cross country run, when the novice and the expert each derive a maximum of enjoyment from the out-



Ski-ing in Canada—View of the famous Revelstoke hill in Revelstoke national park, British Columbia. Amateur and professional ski-jumping records for the world were created on this hill which is considered one of the best to be found anywhere.

making the still air ring with their merry laughter and good-natured jest and the warning cries of "track".

The great outdoor sport of ski-ing has the immense advantage that it can be enjoyed in as leisurely or as strenuous a fashion as the participant desires and on that account almost as many past the age of forty years as

even experienced ones, are unable to see them at all; the objective reality of at least a considerable number of them has however been demonstrated by photography. At the Dominion Observatory the more prominent ones are being mapped and their peculiarities studied; their appearance tallies well with previous observations made elsewhere.

Surrounding the planet's poles are white caps of snow and ice. These regularly wax and wane with the martian seasons; the growth of vegetation and the appearance of the 'canals' seem to be connected with them, as though they depended upon the moisture liberated by the melting of the polar snows for their existence.

Mars was once thought to be extremely cold, but the most recent observations indicate that its temperature is comparable with that of the earth, though somewhat lower; the nights are probably much cooler, due to the smaller atmospheric blanket and consequent greater radiation.

Many explanations have been put forth to account for the 'canals'. What is seen is most probably vegetation growing along lines where moisture is relatively plentiful. Why moisture should be plentiful along such geometrical-appearing lines it is difficult to say. At each succeeding 'opposition' this and other problems are being attacked with vigour, but the mystery of Mars is still as intriguing as ever.

ing. However the craft of ski-ing does not end with the ability to travel quickly over the snow, fascinating as that is, but just as the expert skater goes on to greater development of his skill so the earnest student of ski-ing has before him the technical side of the pastime and scores of difficult feats which give him a glorious sense of mastery over the wonderful instruments of his art.

Ski-ing is rapidly taking hold in almost every part of the Dominion but in Eastern Canada and in the Rocky mountains it is most firmly established and counts its enthusiasts in thousands. Around historic Quebec there is good ski-ing and in the rough, rolling Laurentian country just north of Montreal. Ottawa, the gateway of the glorious Gatineau hills, is another name to conjure skiers with. Out in the Rockies and Selkirk, Banff and Revelstoke are famous winter sports resorts and the annual carnivals held at these points are world renowned for their fun and goodfellowship. Even in the neighbourhood of salubrious Vancouver, skiing may be enjoyed on the slopes of Grouse mountain.

There are to-day numerous ski clubs scattered across the Dominion. Ontario, Quebec, Alberta and British Columbia are all represented in the Canadian Ski Association, the parent body of the sport in Canada. In Ottawa, the capital city, there are two flourishing clubs, one of which, the Ottawa Ski Club, with a membership of 2,200, is the largest in the Dominion and also the largest in the world. It is estimated that there are well over 10,000 active skiers in the Canadian Capital alone and one of the interesting sights is the week-end migrations to the Gatineau hills, where well marked trails lead to comfortable camps in which hot meals may be prepared or purchased. These camps are operated

MARKING HISTORIC SITES IN CANADA

Cairns and Tablets Commemorate Early Events and Persons—Preservation Work Carried On

The National Parks Branch of the Department of the Interior, on the recommendation of the Historic Sites and Monuments Board of Canada, carried out considerable work during last summer in marking historic sites of national importance, in commemorating the public services of a number of outstanding personages, and in preservation work on certain historic ruins. Twenty-two historic sites or places commemorative of historic events were marked throughout the Dominion. Cairns and memorials carrying bronze tablets were erected in Nova Scotia, Quebec, Manitoba, Alberta and British Columbia, while tablets were affixed to the walls of public buildings or to pillars in public places in the provinces of Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba and British Columbia.

In addition to the marking of these sites and places, considerable preservation work was done on the ruined walls of old Fort Chambly and to several massive stone structures at Fort Lennox, both in Quebec. The major portion of the original lands comprising the site of Fort Louisbourg, Cape Breton, Nova Scotia were acquired with a view to future development of this site as a national historic park.

OUTPUT OF ALBERTA'S OIL WELLS IN OCTOBER

Comparative Figures Show Increase Over Corresponding Period in 1927

Comparative figures of the production of petroleum in Alberta during the month of October, 1928, and for the same period in the previous year have been compiled from reports received by the Department of the Interior from operators in the various Alberta fields. There is an increase in the 1928 total of over 4,000 barrels. The figures follow:

	Naphtha (brls.)	Crude (brls.)	Light Heavy (brls.)	Crude Total (brls.)
October, 1928...	26,616	5,724	423	32,763
October, 1927...	21,964	4,658	Nil	26,622

by the clubs for the benefit of their members and their guests. Railway trains, buses, electric cars and motor cars take the throngs of skiers to points of vantage from which the hike to the camp is begun.

One interesting and gratifying outcome of the enthusiastic way in which Canadians and their guests have taken to ski-ing is the rapid growth of the ski manufacturing industry in Canada. The output of ski factories in the Dominion has risen tremendously in the last four years and Canadian skis and ski equipment are competing successfully with foreign products.

As never before thousands in Canada and abroad are heeding the call of the out of doors, and ski-ing has added a wealth of enjoyment to play in the open in winter. No other sport can quite so magically sweep aside dull care and bring peace to the over-wrought nerves. Canadians have found the key to the full enjoyment of their winter season and cordially extend an invitation to those of less favoured climes to come to the Dominion and know the benefit and joy of a sojourn out of doors on skis.

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VARIED USE HAS BEEN MADE OF PLANES IN CANADA

IN FEDERAL ADMINISTRATIVE WORK

Paper Presented at International Conference on Civil Aeronautics by Deputy Minister of the Interior

"When the aeroplane, a decade or more ago, began to be used as a means of transport its value in overcoming the difficulties inherent in travelling over the type of country found in Canada's northern areas was at once recognized." This was one of the significant statements made by Mr. W. W. Cory, Deputy Minister of the Interior, in a paper presented at the International Conference on Civil Aeronautics, held in Washington, D.C., in December.

The paper was entitled "The Aeroplane and the Department of the Interior—Its value in the Administration of one of Canada's Governmental Departments." In the opening paragraph Mr. Cory stated that the Department of the Interior, which came into being shortly after Confederation, was formed to administer Canada's Dominion lands. These originally included all of Canada north and west of Ontario and Quebec, excepting British Columbia. In the sixty years since Confederation, he said, large areas had been settled and otherwise alienated but there still remained in Dominion lands, stretching back from present settlement to the islands in the Canadian sector of the Arctic, more than one half of the total area of the Dominion—a region in which could be placed forty countries of the size of England.

The physical difficulties of administering this northern area where there were no railways, no roads, and, with one or two exceptions—such as that of the Mackenzie River system—no steamboat routes, were sketched and the limitations of travel by canoe and dog team were indicated. It was for these reasons, as stated above, that the Department of the Interior had so warmly welcomed the aeroplane. Mr. Cory pointed out that the Department had not gone into the business of operating the planes but had maintained close co-operation with the Royal Canadian Air Force, the latter furnishing the planes and the officers to operate them and the Department of the Interior, the officers to accompany the planes and direct the particular work undertaken. The Department had put the aeroplane to two major uses: to the protection of the forest and to the surveying and mapping of the country.

The various methods of using the plane by the Forest Service in protection work and forest estimating, and

(Continued on page 2)

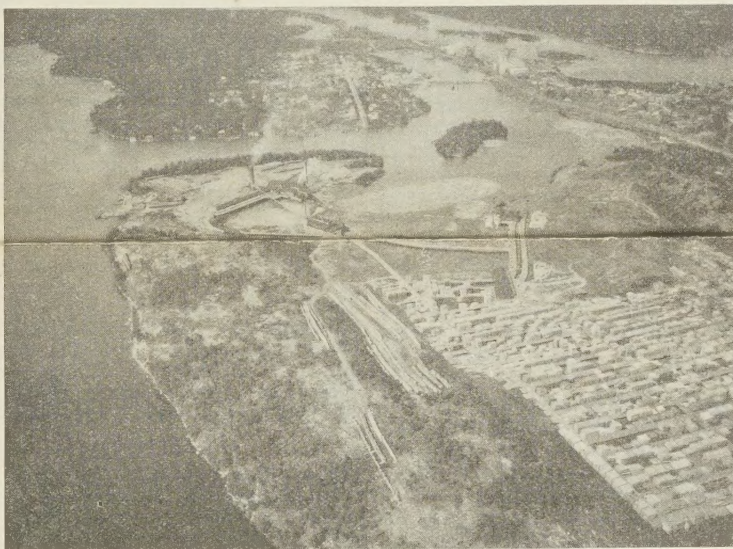
CANADA'S FOREST INDUSTRIES

Extracts from 1928 Annual Review by Honourable Charles Stewart, Minister of the Interior

"The prosperity which was experienced throughout Canada during the past year was not without its effect on the industries connected with the development of the forest resources, and it is my earnest hope that the year upon which we have just entered will bring to them not only a much larger measure of pecuniary success, but a greater assurance of continued pros-

perity through the conservation of the forests upon which they depend.

stroyed by fire in 1928 was below the average of the last few years but extensive fires occurred in northern forests. "The prevalence of fires in northern Ontario, Manitoba and Saskatchewan can undoubtedly be attributed to the unprecedented activity in prospecting for minerals, and in Alberta to the northward extension of settlement. "The efforts which are being made



Canada's Forest Industries—Aerial view of a modern lumber mill in western Ontario. Conditions in the lumber industry showed signs of improvement during 1928.

perity through the conservation of the forests upon which they depend.

FOREST INDUSTRIES

"The importance of the forest industries in Canada's economic fabric was clearly demonstrated during 1928. The setback experienced by the pulp and paper industry was the one drawback which served to slow down somewhat that general increase in national prosperity of which we are all so proud. This setback resulted from an acute state of over-production, following upon the ill-considered and too hasty expansion of mill capacity, to which I had occasion to refer a year ago when dealing with the menace of exhaustion of pulpwood supplies involved thereby.

"The lumber industry has experienced some improvement in 1928 over the previous year. The information available at this time indicates that though production was not materially larger, there was some increase in the amount of lumber exported and the general prosperity of Canada is reflected in a greater demand and somewhat higher prices for home consumption.

FOREST FIRES

"Fortunately the amount of merchantable and accessible timber de-

stroyed by fire in 1928 was below the average of the last few years but extensive fires occurred in northern forests. "The prevalence of fires in northern Ontario, Manitoba and Saskatchewan can undoubtedly be attributed to the unprecedented activity in prospecting for minerals, and in Alberta to the northward extension of settlement. "The efforts which are being made

FOREST REVENUE

"The forests contribute annually in direct revenue to the Dominion and Provincial Governments about \$17,000,000, of which \$7,000,000 is spent in their administration, protection and improvement. The provinces derive substantial net revenue from their forests but the Dominion is spending approximately two million dollars, nearly double the revenue received. This is due to the fact that the Dominion forest lands in the West have suffered so severely from fires in the past, that there is now a relatively small amount of timber of merchantable size from which any revenue can be secured. There are, however, immense areas of young growth which, if protected and properly administered, will in time make the provinces of Alberta, Saskatchewan and Manitoba more than self-sustaining as far as wood is concerned.

"The value of the forests should not be gauged by the direct revenue they

(Continued on page 4)

PRODUCTION OF OIL AND GAS IN WESTERN CANADA

CONTINUED PROGRESS DURING PAST YEAR

Minister of the Interior Issues Statement—Oil Output Reached 489,531 Barrels—Activity in Drilling

"Marked progress was made in 1928 in the development of the petroleum and natural gas resources of Western Canada," according to the annual statement of Hon. Charles Stewart, Minister of the Interior. "The production of oil rose considerably during the calendar year reaching a record total of 489,531 barrels, which is over 150,000 barrels greater than the output during 1927. Other outstanding features of the year's activities were the discovery of dry gas in considerable volume in the Ribstone and Cypress Hills areas and the completion of Well No. 1 of the Okalta Oils Limited in the famous Turner valley, both in Alberta.

"Although commercial production of oil and gas has so far been confined to Alberta, good indications in the prospect wells in that province and near the Alberta-Saskatchewan boundary make it reasonable to expect the extension of the fields eastward. The dry gas well 'brought in' in the Ribstone area close to the provincial boundary must be regarded as having an important bearing on the possibilities of gas in commercial volumes within reasonable distance of Saskatoon and other cities in Saskatchewan. The Cypress Hills well, which has an estimated yield of about 20,000,000 cubic feet per day is a rather important find to the city of Medicine Hat, Alberta, and towns immediately to the east in Saskatchewan.

"The completion of the Okalta No. 1 Well with an overflow of wet gas greater than that of the famed Royalite No. 4, conclusively demonstrates that the production of the latter does not stand an isolated one of that order, but that the dolomitic limestone is capable of still heavier yields, provided the wells are drilled under right conditions. The location of Okalta No. 1 on the western flank of the structure is particularly interesting and most encouraging as to the prospects of the lime in depth generally.

"Following up the success achieved in 1927, there was greater drilling activity last year in the Turner valley and in other areas in the outer foothills, and on the plains extending from the International Boundary to the Clearwater river in the extreme north of Alberta. So far none of these test holes

(Continued on page 5)

CANADA REPRESENTED AT GAME CONFERENCE

Mr. W. W. Cory, Deputy Minister of the Interior, Presents Striking Paper at New York Meeting

Canada's interest in the wild life of this continent outside her own borders is direct and keen chiefly because half the life of many of her migratory birds is spent between the Dominion's southern border and Mexico. In addition, the experience of other nations in regard to game animals and game fish is of the utmost importance to this country. These were the reasons for Canada's representation at the Fifteenth National Game Conference held in New York City, December 3 and 4, under the auspices of the American Game Protective Association.

Mr. W. W. Cory, Deputy Minister of the Interior, who is a vice-chairman of the conference, presented a very striking and practical paper entitled "Some Fundamentals of Game Conservation". The key-note of the paper was virtually this: Why concentrate on the birds that hunters shoot while ignoring diseases which sweep away our feathered friends by millions? These diseases, he said, were of many kinds. The ravages of some of them could probably be entirely checked, and all others could be lessened by preventive measures. There was need for study in several directions. For example, what caused the periodic lessening, almost to the vanishing point, of ruffed grouse even when they were not hunted? What also was the cause of the fall in numbers of other species of birds and of mammals? Attention was also drawn to the very striking connection between the numbers of the hare of northern Canada and sunspots. This was illustrated by a diagram prepared by the Dominion Observatory, Ottawa, showing a comparison of sunspots with wild-life records of the Hudson's Bay Company which indicated that as the former increased the hare decreased, and that the converse was also true throughout a long cycle of about seventy years.

Mr. Cory also explained what had been done in investigating outbreaks that had occurred among waterfowl about some of the smaller lakes in Western Canada and quoted from the published reports of Canadian ornithologists respecting some outbreaks in the United States. He, however, empha-



W. W. CORY, C.M.G.,

Deputy Minister of the Interior, who took a leading part in international conferences at New York and Washington.

sized the point that it was not necessary to wait until the causes of an epidemic were fully known before trying a possible remedy. In this connection he instanced the case of certain marshes in Utah. These, when partially drained, became brackish and the waterfowl which frequented them died in thousands. The reclamation of the marshes by dyking in such a way that they would be flooded with sweet water again would almost certainly be instrumental in saving the lives of vast flocks of waterfowl. In this instance it was stated that the actual cause of the loss of birds was not known but it had been stagnant the marshes the more danger there was of evil resulting. This had an important bearing on the effort to retain marshes and open spaces in the south as winter resting places for migratory birds. There was plenty of room in the great breeding areas of Canada for raising the migratory birds of the continent but this would not avail if there were no areas in which they could spend the winter.

Other fundamentals dealt with by Mr. Cory were the heavy mortality of sea-birds due to oil pollution of the high seas resulting from the dumping of oil near shore by steamers, and the destruction of seashore feeding grounds by trade wastes from centres of population.

The conference dealt broadly and at length with all phases of wild life protection and, among the many resolutions passed was one expressing its

Varied Use Has Been Made of Planes in Canada

(Continued from page 1)

by the Topographical Survey in surveying and mapping were gone into in detail. The Dominion Forest Service in its work in Alberta used only land planes and these, because of lack of suitable landing places, could be employed only for detection purposes, whereas the seventeen aircraft which last summer operated in northern Manitoba and northern Saskatchewan were, because of the abundance of small lakes, all seaplanes. These were used not only for detection but for carrying crews to put out fires when discovered. By the use of aeroplanes it had been possible to make a detailed estimate in one season of the pulpwood on an area of 15,000 square miles in Manitoba.

In the work of the Topographical Survey the aeroplane was finding an increasingly useful place. Canada's problems were peculiarly her own and her citizens might well be proud of the way she had developed, to fit her needs, the new science of mapping by aerial photography. Since this method of surveying was adopted by the Department in 1921 over a quarter of a million square miles had been covered by aerial photographs. The areas covered included large blocks in the northern parts of Ontario, Manitoba, Saskatchewan, and Alberta, and smaller blocks in Eastern Canada, in southern Alberta, and southern British Columbia.

One great advantage of this aerial work was that the same photographs that were used for the general mapping of the country could also be used for specific purposes, as for example: forest type mapping, study of water-power resources, the location of transmission and railway lines, and so on. One of the recent achievements in aerial work was the surveying of the Lac Seul area in western Ontario in one summer, whereas by ordinary methods this would have taken two or three years. Like all new things, Mr. Cory said, the aeroplane had doubtless improvements ahead of it and the Department of the Interior would be interested in all that would make the plane a better agency for carrying on the work of administration.

THE CONFERENCE

The International Conference on Civil Aeronautics, at which the above paper was presented by Mr. Cory, was held at Washington, D.C., on December 12, 13 and 14, 1928. Hon. Calvin Coolidge, President of the United

States, who had invited representatives of foreign governments to attend, opened the meetings with an address in which he explained that the purpose of the conference was to provide an opportunity for an interchange of views upon problems pertaining to aircraft in international commerce and trade. He further pointed out that the conference also celebrated the twenty-fifth anniversary of the first successful flight of a heavier-than-air-machine—that made by the brothers, Wilbur and Orville Wright.

Delegates were present from forty different countries, and all phases of aeronautics were fully discussed.

New Edition of "The Kicking Horse Trail"

A new edition of the "Kicking Horse Trail," the attractive pamphlet issued by the National Parks Service, Department of the Interior, Canada, has been published and is now ready for distribution. This pamphlet describes the beauty and attractions of the new motor highway across the Central Rockies. The Trail begins at Lake Louise in Rocky Mountains national park, Alberta, crosses the Kicking Horse pass, and continues through Yoho national park, British Columbia, and the spectacular Kicking Horse canyon to Golden, British Columbia.

The Banff Golf Course

The Banff golf links, in Rocky Mountains national park, Alberta, which is now operated by the Canadian Pacific Railway Company, is under course of reconstruction and when completed should take its place among the outstanding links of Canada and the United States. Its magnificent situation and the exhilarating air of the mountains gives it exceptional advantages to start with and now that the course itself is being brought up to the requirements of the most expert player, Banff should become a mecca for those who find the enjoyment of this sport necessary for a successful holiday.

Our National Buffalo Herd

Buffalo national park, with its area of 197.5 square miles, is the home of Canada's national buffalo herd, there being a little over 5,000 of these animals now in the park. Moose, elk, mule deer, antelope and yak are also in the park.

Cold Storage Organized in 1895

The Dominion Government organization of cold storage services dates from 1895.



The Turner Valley Oil-field—Section of a panoramic view of the famous Alberta field looking northwest across the central portion. Okalta No. 1 well, the heavy producer completed last year, is located in the group to the left in the picture. Arrows indicate locations of wells.

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OTTAWA, FEBRUARY, 1929

Production of Oil and Gas in Western Canada

(Continued from page 1)

has reached a depth to give conclusive results but the many indications encountered are encouraging. The total footage drilled in deep test wells in Western Canada during the eleven months ending November 30, 1928, was 163,137, representing 101 wells in actual drilling. During the year the completions in Alberta were: producing wells, oil and gas, 17; producing wells, gas only, 3; total 20. Seven wells were abandoned through accident or negative geological indications.

"The practice is becoming general, before commencing deep drilling operations, of having prospective areas tested by means of a series of shallow bore-holes. This serves to fix the elevations of a number of points on some given geological horizon encountered in the various bore-holes. From information thus secured prospectors are enabled to map the geological structure with fair accuracy, and so indicate the most suitable spots for test drilling down to the major productive horizons. In all there are eight different and independent parties now engaged on this class of work in Alberta, and their efforts may confidently be expected to result in information leading, in the near future, to the location of other productive areas than those at present recognized.

"The following comparative table shows the increase in oil production in Alberta in the last four years:

REVIEW OF MINING DEVELOPMENT IN 1928*

Increased Expansion in Mining and Metallurgy—These Industries Extended to Entirely New Areas

Outstanding features in mining development during 1928 were the increased expansion in both mining and metallurgy in established producing districts and the extension of these industries to entirely new areas. Increased activity in the established camps was due to the keener interest evidenced in mining throughout the Dominion, to the increased demand for the industrial minerals, and to the consequent rise in the price of a number of these. New areas formerly considered too remote to permit of profitable exploration have been made accessible by the introduction of aerial transportation, and the success achieved by this method in various parts of the north insures the continued employment of the aeroplane in the work of mineral exploration and preliminary development. A definite advance in the exploration of the important base metal deposits of the northern Manitoba-Saskatchewan boundary region has been secured by the completion of the railway to the Flinflon area and further progress will now be made by the continuation of this line to the north-east. Railway construction on the Hudson Bay route may also be ex-

pected to aid appreciably in the development of the mineral resources of that region.

Operations conducted in the various provinces have, on the whole, been very satisfactory. Nova Scotia and New Brunswick again experienced a period of comparative prosperity following the lean years of the post-war period. The coal mining industry has gradually improved and the gypsum output has grown impressively. A revival of interest was shown in Nova Scotia's gold possibilities, and the production of salt increased.

In Quebec much attention has been attracted to developments in the Rouyn and adjoining areas. In addition to the Horne (Noranda) mine, now definitely considered as a very important copper proposition, western Quebec contains a number of promising ore deposits on which a good deal of underground work has already been done. Plans already announced include the installation of milling and concentrating equipment and give other indications of vigorous development. In other parts of the province satisfactory progress has been made in the mining of asbestos and other minerals.

The Sudbury district of Ontario has attracted a new permanent interest by the recent discoveries in that area of enormous copper-ore bodies and of smaller lead zinc-copper deposits. Increased production of gold from the Kirkland Lake area has been more than sufficient to offset a decrease from the Porcupine. Underground development in both of these areas, together with the activities proceeding in the new districts, indicates a fairly long lease of life for the Ontario gold mining industry.

In the Prairie Provinces the railway construction referred to above has been the outstanding event of the year. Noteworthy progress is reported from both the northern and south-central Manitoba mining fields, and aerial prospecting companies operating in northern Manitoba and Saskatchewan and in the Northwest Territories report a successful season. A number of important developments have taken place in the oil-fields of Alberta which considerably enhance the prospects for increased production of petroleum and natural gas.

The intense activity prevalent in all mining districts in British Columbia during 1928 will no doubt be reflected

METER RATING STATION EQUIPMENT IMPROVED

The Dominion Water Power and Reclamation Service in connection with its hydrometric surveys in every province of the Dominion has in active use a total of ninety current meters. To ensure that the stream flow records obtained have a high standard of accuracy, it is necessary that each meter be tested and re-rated at least annually.

For this purpose the Service maintains a central rating station located at Calgary, Alberta, and operated under the supervision of the Commissioner of Irrigation. The Calgary Rating Station is the only one of its kind in Canada, and in addition to rating Water Power and Reclamation Service meters, it is receiving annually an increasing number of meters from other organizations.

The Honourable Charles Stewart, Minister of the Interior, has recently authorized extensive improvements to the station, consisting of a 100-foot extension to the concrete water tank; the installation of an electrically operated car for moving meters through the water tank at the variable speeds necessary in rating; and the construction of a workshop. When these improvements are completed, the Calgary Rating Station will be fully equipped with the most modern appliances for testing and repairing meter equipment.

in substantially increased figures of production. The year has been a record one for Consolidated Smelters both in mining operations and in metallurgical output and the operations of this company may be said to reflect conditions throughout the province. Development plans include large additions to milling and concentrating equipment and forecast continued increased production.

After years of moderate but sustained progress the mining industries have become one of Canada's most important economic assets and one which may be depended upon to play an influential part in the work of national development. Events of the last few years have been largely responsible for creating what may be termed a mining consciousness in the people of the Dominion, and the results of this are becoming apparent in the wider and better organized efforts being made to develop this phase of the country's resources.

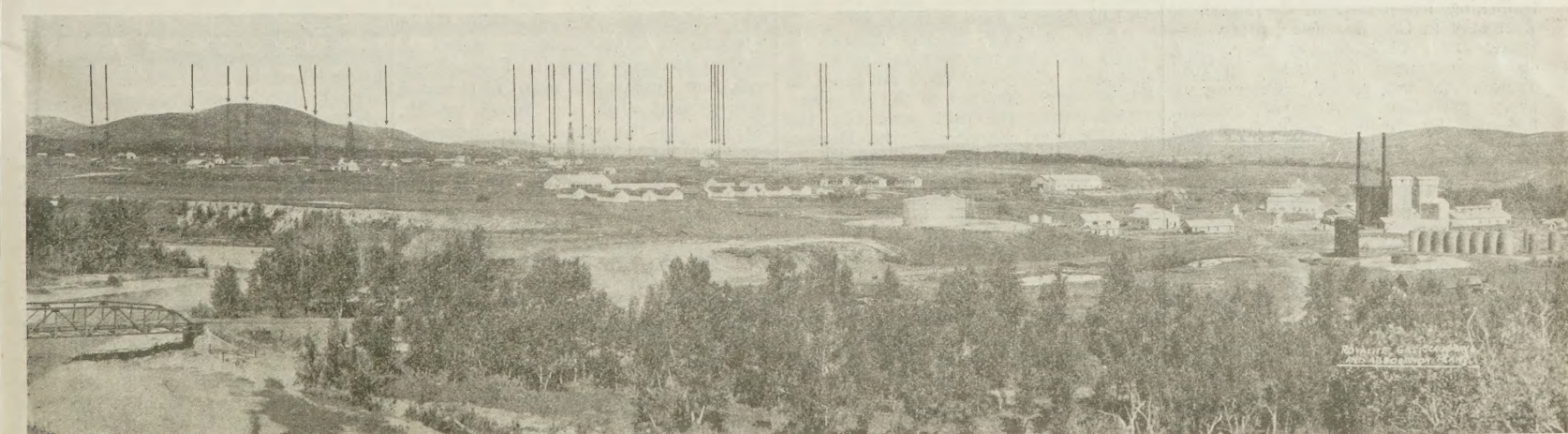
*Prepared by Dr. Charles Camsell, Deputy Minister, Department of Mines, Canada.

	Naphtha (brls)	Light Crude (brls)	Heavy Crude (brls)	Total (brls)
1925 ..	165,717	2,926	Nil	168,643
1926 ..	211,008	2,609	5,981	219,598
1927 ..	290,270	38,808	3,055	332,133
1928 ..	410,623	70,734	8,174	489,531

"Below is a statement of the natural gas produced and used in Alberta in 1928.

Field	Amount (M cu. ft.)
Turner Valley—	
For use in field ..	1,884,167
For use by refinery ..	1,169,757
For use by Gas Company ..	4,339,766
Bow Island ..	7,000
Foremost ..	712,000
Barnwell ..	5,000
Brooks ..	38,000
Viking ..	2,377,769
Wainwright ..	126,000
Bow Island Town ..	36,000
Wetaskiwin ..	50,000
Bassano ..	2,000
Redcliff ..	860,000
Medicine Hat—	
City ..	1,748,500
Private Wells ..	825,000
Farm Wells ..	18,000
Total ..	14,198,959

"The above oil production figures show at a glance the success which has been attained in this Western Canada field and in view of the experience which has been gained concerning the geology of this area gives ground for well-founded optimism."



The Turner Valley Oil-field—Adjoining section of panoramic view showing where the greatest development has taken place. To the extreme right is seen the scrubbing plant of the Royalite Company. Royalite No. 4 well is one of the group of four on the skyline a little to the left of the storage tank. Photo—W. J. Oliver, Calgary.

CANADA AMONG LEADERS IN NARCOTICS CONTROL*

**Dominion Early took Measures Against Evil
—Federal Legislation is Up-to-date**

One of the most urgent social problems confronting the League of Nations is the world-wide illegal use of drugs, but long before the formation of the League, in the work of which Canada has taken an important part, the Dominion had enacted drastic measures for the control of the opium traffic and the elimination of the illicit use of narcotics within her boundaries.

The first Act dealing specifically with the subject in Canada was passed by the Dominion Parliament in 1908. This made it an offence to sell, offer for sale, possess, or manufacture opium prepared for smoking, or crude opium for other than medicinal purposes. Three years later in 1911 further enactment brought the three drugs—heroin, morphine, and cocaine—under control, and on account of these statutes the Dominion was justly regarded at that time as having the most advanced legislation thereupon in the world. With a view to the international control of the opium traffic, Canada was represented at the subsequent conferences at the Hague in 1912 and 1915.

In 1919 the Department of Health of the Government of Canada was created, and to it was assigned the administration and supervision of the enforcement of the Opium and Narcotic Drug Act. As a result the Narcotic Division was formed within the Department. Since the war, the organized activities of the Dominion, like those of other countries, have been centralized and co-ordinated in the Opium Conference of the League of Nations, which holds frequent meetings at Geneva.

In addition to making it an offence to possess, manufacture, sell, or distribute the various derivatives of opium and cocaine, except for medicinal or scientific purposes, the 1911 Act stipulated that these drugs should be sold only by a bona fide wholesale or retail druggist to physicians, veterinary surgeons, or dentists, or on prescriptions issued by members of these professions. As a matter of fact, the Hague Conference agreements were to all intents and purposes already embodied in the Dominion's 1911 Act, but these agreements were never ratified by other countries until after the conclusion of peace, when the Treaty of Versailles included a clause whereby the International Opium Convention was incorporated therein and brought into force.

In conformity with the ideals of the League of Nations, a still more stringent act was passed by the Dominion Government in 1920, and in 1922 an amendment was made providing for the deportation of all aliens convicted of trafficking, irrespective of the length of their stay in Canada. Incidentally, between June, 1922, and January, 1927, 466 persons were deported. In 1923 another Act was passed, tightening up every probable loophole of evasion, followed by further regulations and amendments in 1924, 1925, and 1926, which made the legislation on the subject as perfect as humanly possible. The Narcotic Act as it now stands specifies a maximum penalty of seven years imprisonment with a minimum of six months, and a maximum fine of \$1,000, with a minimum of \$200 in case of trafficking, while, in cases of sale of narcotics to a minor, the court is empowered to impose the lash in addition to any other punishment.

Owing to her strategic position between the East and West, Canada is one of the world's highways over which this traffic would naturally pass. Her alertness, therefore, in combating the narcotic evil not only conserves the

SURVEY OF REGION NORTH OF LAKE ATHABASKA

**Area Covered Indicates the Advancement in Recent Years in Methods of Surveying
for Mapping in Canada**

Methods of surveying for mapping have changed greatly in recent years in Canada. Compared with methods of a century ago, the advancement has been great and the saving of time and money tremendous. The long strides which have been made in late years in increasing our fund of knowledge about the Dominion's great northland, and the marked progress in the surveying and development of the newer parts of Canada have been due in large measure to the use of the camera and the aeroplane. Maps now being produced by the Department of the Interior show how far aerial surveys have gone toward the rapid, accurate and economical mapping of the Dominion.

If one were to take Captain Back's map of the Great Fish river (now Backs river) as completed by him following his famous overland trip begun in 1833, it will be seen that only such rapids, falls, lakes, and islands are shown as could be seen while passing by in a canoe or going across a portage on foot. It did not include much information about the country lying back from the route travelled. Upon such surveys were based the earlier maps of some of the northern portions of Canada.

Immediately following Confederation and for some years thereafter the survey work of the Department of the Interior in Western Canada was primarily for the purpose of subdividing the land in anticipation of later settlement. These surveys were in accordance with a regular system, the initial lines for which were meridians and base lines. The meridians were, in general, laid down four degrees in longitude apart, and the base lines were twenty-four miles apart. When these governing lines began to reach into the more wooded and little known areas of the north, an effort was made to gather sufficient information on each side of them to fill in the more important topographical details. The places where the governing lines intersected the shores of lakes and streams, and other physical features, were noted. In addition it was the duty of one of the men on the survey party, called the explorer, to travel over a strip twelve miles wide on each side of the governing line, noting the topography of the country through which he passed. The results as obtained from the line notes and the explorer's observations were compiled in the form of a map of a 24-mile wide strip. United, these strips formed the best available map of the areas covered. They could not, under the circumstances, be extremely accurate or full of detail and a surveyor who mapped, in this way, about 3,000 miles of territory could justly feel that he had done a good season's work.

As an instance of the manner in which mapping methods as applied to this type of country have advanced in the last few years, one of the areas surveyed during the past season by the Topographical Survey of the Department of the Interior, working in co-operation with the Royal Canadian Air Force, may be mentioned. This area lies, roughly speaking, in the triangle formed by the 60th parallel of latitude, the Slave river, and lake Atha-

baska. Most of this area is in north-western Alberta, some is in Saskatchewan, and a small portion is in the Northwest Territories. It is rocky country abounding in lakes of all shapes and sizes up to twenty miles in length, some of them of great beauty. Sandy stretches occur here and there, and forest fires have kept the timber scanty. The lakes make ideal landing places for the types of flying boats used in the work of aerial photographic surveying.

The party engaged in this work left Winnipeg by seaplane on July 28, and on August 4 alighted in the harbour of Chipewyan. On August 9 the plane used for taking the photographs flew to Fitzgerald from which point the work was carried on for the remainder of the season. Notwithstanding interference from smoke, by September 7 about 4,600 square miles of territory had been covered, thus filling in another blank space on our maps.

Canada's Forest Industries

(Continued from page 1)

yield but rather by the contribution they make to the prosperity of the nation. Practically every industry is dependent to a greater or less extent on the products of the forest. Agriculture derives perhaps more benefit than most of the other industries, since the value of the forest products from the farms amounts to about \$75,000,000 and, in Eastern Canada especially, the woods operations furnish a large proportion of the rural population with remunerative labour and markets for farm produce. The products derived annually from the forests of Canada are valued at about \$475,000,000 and it is safe to say that at least \$450,000,000 of this is distributed throughout the Dominion for labour, equipment, and supplies. In the fiscal year ending March 31, 1928, the exports of forest products were valued at \$283,404,649 and imports at \$36,918,883, leaving a favourable trade balance of \$246,485,766. In our trade with the United States the balance in our favour was \$206,144,230.

CONCLUSION

"In closing I would sound a note of warning that the time has come in Canada for a national stock-taking of our forest resources, and a review of our forest-management policies. The struggle to retain and expand present markets for forest products must not blind us to the fact that there is a serious difference between, on the one hand, legitimate production-and-marketing campaigns—in short, healthy competition—and on the other hand, unwise exploitation with consequent waste not only of financial resources but of natural resources as well. For nothing will show quicker the result of skimmed management than our forest wealth. So long as the wood-using industries are on a sound working basis they can be relied upon, through the revenue they produce, to bear the major cost of forest conservation and forest fire protection. Under these conditions only may we hope to prepare our forest estate for the future demands of a wood-hungry world, that Canada may reap full benefit from the ability to fill the need."

The Porcupine Gold Area

The Porcupine gold area in the District of Cochrane, northern Ontario, occupies first rank among the gold producing areas in Canada.

FORT LOUISBOURG A FAMOUS HISTORIC SITE

**Department of the Interior Acquires Land
Around Ruins for Preservation Work**

The site of Fort Louisbourg on Cape Breton island, Nova Scotia, the scene of some of the most stirring events in the early history of Canada, is to be marked and preserved as a national monument because of its outstanding historic importance, according to plans formulated by the Department of the Interior. Approximately 328 acres of land surrounding and including the remains of the famous French fortifications have been acquired by the Department through its National Parks Branch and the work of preserving the few remaining traces of the old fort and of marking other points of historic interest in the vicinity is being proceeded with. A monument in the form of a tall granite pillar surmounted by a cannon ball was erected by the Society of Colonial Wars of America in honour of those who fell at Louisbourg in the two famous sieges of that fortress. This monument was later transferred to the Department of the Interior. Two fieldstone monuments, each bearing a bronze tablet, mark the sites of the King's Bastion and the Dauphin's Bastion, while tablets affixed to the lighthouse on the other side of the harbour commemorate the heroic deeds of the British and French batteries during the engagements of 1745 and 1758.

The events which occurred at Louisbourg almost rival in historic interest and importance those immediately preceding the capture of Quebec. At Louisbourg the French had built a massive fortress after the system of Vauban and according to Parkman costing not less than 30,000,000 livres. By fortifying Ile Royale (Cape Breton) they intended to guard the entrance to the St. Lawrence and conserve their possessions in the New World.

In the year 1717 the building of the fort was commenced from the plans of Sieur Verville, the engineer sent out from France for the purpose, and the work was not finished till 1740. Five years later, in 1745, the citadel was besieged by the New England forces, led by Colonel Pepperell with Commander Warren of the King's navy in charge of the naval forces. They were opposed by the French Governor Du Chambon and Captains "Corsair" Mornay and de Thierry. The siege ended after a struggle which lasted forty-seven days in the capitulation of the French defenders, who had been much weakened by semi-starvation, mutiny, and lack of ammunition. To the disappointment of the New Englanders the fruits of victory were abandoned by the British authorities at the treaty of Aix-la-Chapelle, in 1748, and Cape Breton with its magnificent fortress was handed back to the French.

In the second and more famous battle of Louisbourg in 1758 the land forces were under the command of the British General Amherst and the sea forces under Admiral Boscawen while Governor Drucour was in charge of the fort and Captain Des Gouttes of the French naval forces. The siege commenced on June 7 and ended with the capitulation of the French on July 26, a period of forty-nine days, during which occurred many stirring episodes. Two years later the noble citadel was completely destroyed by the British and levelled to the ground, with the exception of a group of casemates. The last blast was fired on October 17, 1760. The siege of Louisbourg was followed by the capture of Quebec and the final withdrawal of the French armies from the continent of America.

*Prepared at the direction of Dr. J. A. Amyot, Deputy Minister, Department of Pensions and National Health, by Mr. C. H. L. Sharman, Narcotic Division.

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COMPLETE SURVEY SOUTHERN PART OF MUSK-OX PRESERVE

EXPLORERS PATROL FAR
NORTH WILDERNESS

Valuable Wild Life Data Gathered in Region East of Great Slave Lake

Word has been received in the Department of the Interior that Mr. W. H. B. Hoare, explorer of the North West Territories and Yukon Branch, and Warden A. J. Knox, of Fort Smith, N.W.T., have completed an examination and patrol of the southern portion of the Thelon game sanctuary east of Great Slave lake. After a survey by dog team and canoe covering eight months they returned to their base near the site of old Fort Reliance on December 13, and began preparations for the immediate resumption of the work so as to complete it this year. The survey of the 15,000-square-mile game preserve was begun in April last year and from that time until the receipt of the report on January 11, no word had been received from the investigators. Police patrols and other parties passing through the areas were asked to keep watch for the departmental party but without results, the wireless message dated January 10 from Fort Smith being the first intimation. Head Office officials at Ottawa had of the movements of Messrs. Hoare and Knox.

Much valuable information was obtained by Mr. Hoare and his companion during their survey of the southern part of the Thelon sanctuary. Musk-ox were seen along the Hanbury river and tracks of these rapidly disappearing big game animals were noted in the vicinity of the Thelon river. Large herds of caribou were reported south of the sanctuary. Wolves were also numerous but they proved wary of both trap and gun.

Mr. Hoare left Ottawa for the North early in January, 1928, taking with him six Baffin Island huskies to form his dog-team during the patrol. He began his overland trip to Fort Smith from the end of steel at McMurray, Alberta, on January 23 and covered the 300 miles to Fort Smith by February 3. Here the equipment was completely overhauled and supplies secured. Then, accompanied by Warden A. J. Knox, Mr. Hoare entered upon one of the most arduous stages of the trip namely, the 500-mile journey via Resolution to the east end of Great Slave lake, where the base camp was established. About the middle of April the party began their patrol of the sanctuary.

(Continued on page 4)

NEW PULP AND PAPER INSTITUTE

His Excellency Lord Willingdon Opens Research
Laboratories at Montreal—Address by Hon.
Charles Stewart

That the pulp and paper industry was passing through a period of temporary depression which would give way to a return to prosperous conditions in the near future was the keynote of the principal addresses delivered in Montreal recently at the opening of the Pulp and Paper Research Institute by His

agreement whereby they contributed funds and personnel and assumed a voice in the direction of the work.

The chairman at the inaugural ceremony was Col. C. H. L. Jones, President of the Canadian Pulp and Paper Association, who opened the proceedings with a short address of welcome.



New Pulp and Paper Institute—Scene in the recently completed research laboratories, Montreal, when His Excellency the Governor General at the official opening turned the electric switch which set in motion the paper-making machine (commercial model) which forms an important part of the modern equipment of the Institute. The figures, from left to right, are, Mr. V. M. Drury, President of the E. B. Eddy Company, Hull, Que.; Professor H. Hibbert, of McGill University, Montreal; Hon. Charles Stewart, Minister of the Interior; His Excellency, the Governor General; Mr. E. P. Cameron, Chief of the Pulp and Paper Division, Forest Products Laboratories; and at the extreme right, Col. C. H. L. Jones, President of the Canadian Pulp and Paper Association.

Excellency, Lord Willingdon, Governor General of Canada. In the new structure—which was made possible by the co-operation of the Canadian Pulp and Paper Association, McGill University, and the Dominion Government—will be undertaken investigative work which will undoubtedly be of the greatest value in solving the problems relating to the manufacture of pulp and paper and allied products.

The new laboratory, the finest of its kind in the world, is emblematic of the value of co-operation as an instrument of progress. During the last sixteen years the Department of the Interior has been engaged in research work in pulp and paper, looking to the advancement of Canadian industry. The Pulp and Paper Association, sensing the value of the work being done and realizing the importance of expanding it more rapidly than ordinary government expenditure would permit, entered into an

In the absence of General Sir Arthur Currie, Principal of McGill, Dean C. F. Martin, Acting Principal, represented the University.

His Excellency the Governor General officially opened the new laboratories by turning on the current in a small pulp and paper mill designed on the latest commercial lines, which forms an important part of the equipment. In beginning his brief address, Lord Willingdon expressed the hope that the health of His Majesty the King would continue to improve and that Sir Arthur Currie, who took a prominent part in the negotiations leading to the establishment of the institute, would return from his trip abroad, restored to health and vigour. Continuing, he pointed out the necessity for research in all its bearings in the advancement of the Dominion's industrial and commercial life. A country that did not

(Continued on page 3)

EXTENSION AND IMPROVEMENT OF PARK HIGHWAYS

RAPID OPENING UP OF
SCENIC RESERVES

Much Engineering and Construction Work Carried on in Canada's National Parks in 1928

In Canada's 11,000 square miles of national parks steady progress is being made in opening up new and outstanding points of scenic beauty to the motorist and the tourist. Engineering and construction work carried on during 1928 by the National Parks Branch of the Department of the Interior greatly increased the facilities for the comfort and enjoyment of visitors, and preparations for the coming season's tourist flow are now well advanced. The motor roads in the national playgrounds in the Western Provinces were extended during last year and considerable maintenance and improvement work carried out so that there are now slightly over 400 miles of first class highways in the parks. In addition the mileage of tote or secondary roads has been increased to a figure close to 100, new riding trails have been laid out and completed, the installation of a new sewage system in Jasper townsite was begun and considerable other improvement and maintenance work of lesser importance was carried on.

From the highway standpoint, the largest work undertaken during 1928 was the construction of a new trunk road in Prince Albert national park in Saskatchewan. This road extends from the southern boundary of the park, which is thirty-five miles north of Prince Albert, to the centre of park activities at Waskesiu lake, and is approximately thirty-four miles long. Grading was completed by the end of October and the bridges were in place in January of this year. It will be officially opened to traffic during the coming summer. In Banff park, Alberta, a new road with a maximum grade of six per cent was built from the town of Banff to the new public motor campsite at Tunnel mountain. This road is three-quarters of a mile long and of standard width. A considerable extension was made to the Akamina Pass road in Waterton Lakes park, which will eventually connect Alberta and the park with the Flathead River valley in British Columbia and Glacier park in the United States. Through the co-operation of the town of Wainwright, the adjacent municipalities, and the National Parks Branch, a new road was constructed from the town to the entrance to the main pad-

(Continued on page 4)

A NATION-WIDE INVENTORY OF OUR FOREST RESOURCES

PROVINCES INVITED TO
CO-OPERATE

Hon. Charles Stewart Makes Important
Announcement in Address at Canadian
Forestry Association Meeting

"What is the present situation with regard to our forest capital? It is that, broadly speaking, we know neither the amount of our capital nor the interest, in the way of annual growth, we are receiving, and are, therefore, unable to decide whether the operations of our forest industries may be expanded or should be curtailed. While information regarding timber resources is available for various parts of the country, the data are fragmentary at best, and no serious attempt has as yet been made to calculate the amount of wood produced by annual growth, or to balance that amount against depletion by industry, fire, insects, fungi, or storm."

In the foregoing succinct paragraph Honourable Charles Stewart, Minister of the Interior, told the members of the Canadian Forestry Association in annual session at Ottawa the situation as regards our forest resources. This statement prefaced the announcement that a forest census was to be taken through the co-operation of the Federal and provincial governments upon which could be based their future policies with respect to Canada's forests.

Honourable Mr. Stewart opened his remarks by paying tribute to the splendid work of the Canadian Forestry Association and followed by asking the co-operation and practical assistance of its members in what he termed "a piece of work of national importance". He referred to the significance to all Canada's interests of the forest industries and called attention to the present marketing troubles in the news-print industry. He said that the present time appealed to him as being particularly propitious for the inauguration of a nation-wide inventory of Canada's forest resources which would be complete enough to provide all forest authorities in the Dominion with data from which permanent forest policies might be evolved.

Continuing he said, "Surely we cannot longer blind ourselves to the fact that until we know the nature and extent of our merchantable timber, the area and composition of our young growth on which future supplies must depend, and the gross and net increment from annual growth, we cannot hope to manage our great forest heritage intelligently, or with that regard for the future well-being of this country which duty demands we keep always in mind. In brief, we cannot hope to have a sound forest policy until we know what we have, how fast it is growing, and what the inroads on it are."

He said that in view of the fact that the administration of the forests was for the greater part within the jurisdiction of the provinces, it was obvious that a national inventory of the forest resources of the country could only be obtained with the full assistance and co-operation of the provinces concerned, each of which would of necessity

NEW QUARTZ MINING REGULATIONS

Aim to Improve Prospecting and Operating Conditions in
Mineral Areas on Dominion Lands

The recent remarkable progress made in mining development on Dominion lands in Western Canada, particularly in the provinces of Manitoba and Saskatchewan, has attracted nation-wide attention. The Department of the Interior in order to encourage and foster the future healthy growth of the mining industry in that part of the Dominion has kept in constant touch with the rapidly changing situation and has, by regulations and close supervision, taken measures to protect the interests of both the industry and the public.

New quartz mining regulations, which contain provisions for the improvement of prospecting and operating conditions, have been drafted by Honourable Charles Stewart, Minister of the Interior, and passed by Order in Council to go into effect on April 1, 1929. The major changes that have been made in the old ordinances have been for the purpose of bringing the new regulations abreast of present conditions and of securing uniformity by correlating federal and provincial enactments.

The new regulations provide that every person and organization engaged in mining activity on Dominion lands must hold a miner's certificate. Such a certificate entitles the holder to stake and record three claims for himself and three claims for each of two other licensees or nine claims in all (a total of about 450 acres) in each mining division. In the Northwest Territories double this number—that is to say eighteen claims—may be staked and recorded. All claims must be marked by four legal posts and, as soon after the recording as reasonably possible, metal tags supplied by the Department of the Interior must be attached to the posts.

Before a lease can be issued to a licensee, two hundred days work must be done on the claim during a period of five years or less. Provision is also made so that, if desirable, improvement work may be started as soon as the legal posts are in place. At least forty days work must be done in each year. When two hundred days work has been performed, the claim surveyed, discovery established, and certain other requirements complied with and accepted, the recorded owner will be entitled to obtain a certificate of improvements, and upon payment within three months of the rental and fee, he will be entitled

undertake the work within its own boundaries. The Premiers of each of the provinces had been invited to co-operate in this most important work with the suggestion that a conference be held to decide on a standard procedure. The Federal Government would do its share, he said, by making the necessary investigations on lands under its control, and by compiling and publishing the final results of the provincial and federal returns.

Honourable Mr. Stewart closed his address by inviting the members of the Association to visit the Forest Products Laboratories of the Department of the Interior in their new quarters at Ottawa, where an idea would be gained of the work of the Department in the interests of forestry and the better conservation, through wise utilization, of the forests of the Dominion.

to a lease for a period of twenty-one years, without further payment of rental. Renewal for an additional period of like duration is subject to rental. All assignments or options, after the issue of a lease, must be filed with the Minister of the Interior and in the case of a conditional assignment its acceptance and registration is at the discretion of the Minister.

Considerable change has been made in the clause covering the collection of royalty. Instead of royalty being paid at the rate of two and a half per cent of the value of the sales of the products of the location, as at present provided, the new regulations require that the payment be made on the profits of the mine in excess of \$10,000 during any calendar year. This royalty is fixed at three per cent of the annual profits over \$10,000 and up to \$1,000,000; five per cent of the excess over \$1,000,000 and up to \$5,000,000; and a proportional increase of one per cent on each additional \$5,000,000.

Certain other major changes have been made as to fractions by which the Minister may lease such small areas to adjoining holders, and also as to mining partnerships, operations, inspection, schedule of fees, and a provision for claims located and not yet recorded at the time of the coming into effect of the new regulations. In the latter it is provided that any person who may have staked a mineral claim or claims as nearly in accordance with the provisions of the late regulations as circumstances would admit, and who may have submitted applications for entry therefor within the prescribed time but who, for any reason, may not have received such entry, may be granted entry under the new regulations.

The prospecting and mining of the mineral bearing areas on Dominion lands in the West have taken place under the careful scrutiny of the Minister of the Interior, and the new Dominion Mining Regulations embody the most effective and progressive provisions of administration and operation in keeping with the advance of mining development in Western Canada.

HISTORIC VISIT RECALLED

Just one hundred years ago, Sir George Simpson, governor of the Hudson's Bay Company, visited Norway House one of the important fur trading centres of the company. This incident as well as many others in the early history of the fur trade in Canada is recalled by the publication of the Norway House sheet of the National Topographic series by the Topographical Survey, Department of the Interior, Ottawa.

Canadian Rockies Well Known

There is one feature about the Canadian Rockies that has not been appreciated as yet in this country, and that is the reputation these mountain ranges have with the most experienced mountain climbers of the world. It will surprise some to learn that many parts of the Rocky mountains are exceedingly well known in Europe and in the United States, and that men who have for years spent their holidays in the Alps are now coming to Canada year by year.

SAFEGUARDING CANADA'S NATIONAL TIMEPIECES

New Vault Constructed at Dominion
Observatory to House the Primary
Clocks

Among the most treasured and most carefully guarded instruments of an observatory are its clocks. This is especially true of the principal national observatories such as Greenwich, Washington, Paris and Berlin, which have the duty, in addition to more purely scientific investigations, of keeping national time. No part of the instrumental equipment of such observatories is more carefully tended, more zealously guarded against all extraneous influences, than the primary clocks. At the Dominion Observatory at Ottawa, Canada's national observatory, the same care is exercised, the same almost worshipful devotion paid to these highest examples of the instrument-maker's art.

There are two main reasons for such meticulous care: In the first place observations on the stars, from which correct time is obtained, can be secured only on clear nights, and during the sometimes long intervals of cloudy weather the duty of preserving the time falls on the primary clocks. Not only must time above suspicion be supplied to an exacting public, but to the more exacting few who use it for rating and adjusting other timepieces of high precision, and for other scientific purposes. Secondly, but more important still to the observatories themselves, many of their most important investigations demand the measurement of intervals of time extending over several hours, or even a complete day, with an accuracy of the order of a hundredth of a second. Such accuracy can be obtained only by the utmost refinements which it is possible to apply.

Modern experience shows that in order to protect them from temperature changes and from minute mechanical vibrations these clocks are best housed in an underground vault independent of other buildings. In Paris the clock vaults are located in old subterranean passages, 90 feet below the surface of the ground. At the Dominion Observatory, where the primary clocks had for a number of years been mounted in a specially fitted room in the basement, a modern clock vault was built in 1927, and was put into use in 1928. The new vault is located about fifty feet north of the Observatory. The roof is four feet under the surface of the lawn and the entrance is from the shelter for the coelostat telescope. The construction was unusual. After the necessary excavation, a 3-inch layer of concrete was put over the broken stone and tile placed for drainage. On this concrete a layer of tar and burlap was placed to exclude moisture; then another layer of concrete forming a slab twelve inches thick was poured on top of the tar. On this, reinforced concrete walls and roof were built and tarred inside and out. At this stage it resembled a large watertight box with a door leading to the stairs. Leaving a four-inch air space inner walls of tile and a ceiling were built. Tile partitions divide the vault into four rooms 6 feet by 6 feet by 8 feet high, a hall from which the four rooms open, and a small vestibule between the stairway and the hall. The stairway also has double walls. Each clock is mounted on a concrete pier

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HON. CHARLES STEWART,
Minister

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Deputy Minister

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OTTAWA, MARCH, 1929

NEW PULP AND PAPER INSTITUTE

(Continued from page 1)

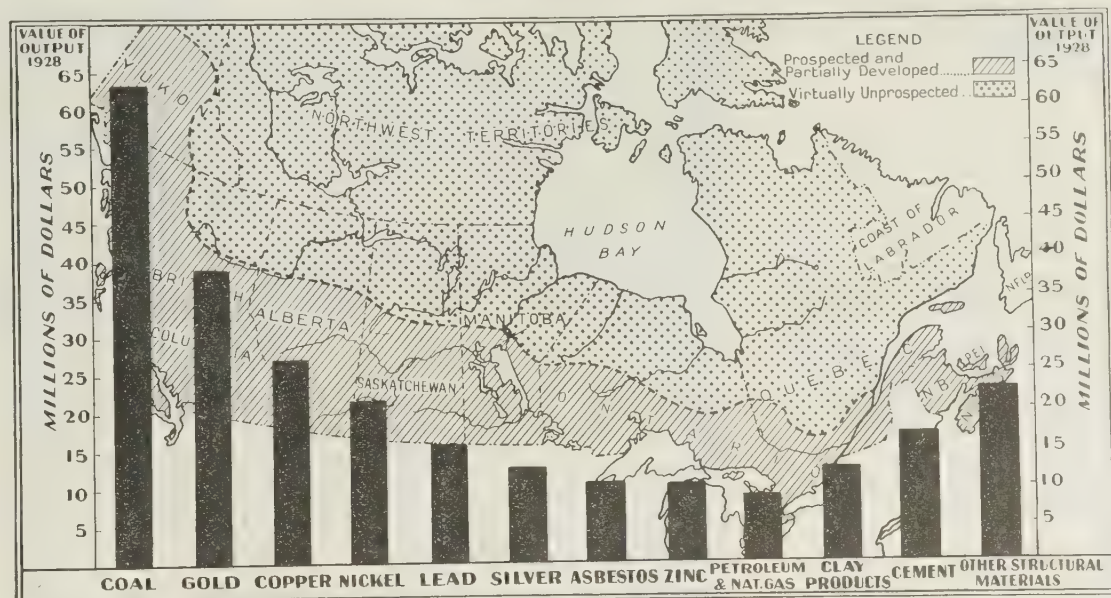
keep abreast of new conditions, he warned them, was soon left in the lurch, owing to the keen competition which research has developed in the world today.

Lord Willingdon referred to the establishment of the Forest Products Laboratories by the Department of the Interior in 1913 and reviewed briefly the progress of the work up to the present. He said that he hoped most profoundly that while these three great administrative bodies—the Canadian Pulp and Paper Association, McGill University, and the Dominion Government—were carrying on their individual activities, there would always be, with regard to pulp and paper, the closest co-operation among them all. He had had many opportunities during his residence in Canada to realize the great importance of the pulp and paper industry and had seen the great mills in different parts of the country. While he realized that there was at present a slight lull in the prosperity of the industry he felt certain that better conditions were only delayed for a short time and that they were bound to return. He pointed out that if Canada's great forest resources were properly conserved, they would provide a source of raw material for all time to come.

In concluding, His Excellency said that he had no doubt that the Research Institute would produce effective means for the more efficient development of the industry and that many young men through their studies here would have useful and prosperous careers before them.

Honourable Charles Stewart, Minister of the Interior, in following, first joined in the expression of hope for the speedy recovery of His Majesty and for the early return to duty in renewed health of Sir Arthur Currie. He then referred to the part played by his Department in the matter of research in forest and wood problems, to his own deep interest in the question of research, and to the time and attention he had given the subject during his public life. He outlined the events leading up to the establishment of the Pulp and Paper Research Institute and expressed the feeling that manufacturing institutions throughout Canada would profit by what had been accomplished for pulp and paper research and by the example of the Canadian Pulp and Paper Association. The dollars and cents value

THE SCOPE OF CANADA'S MINERAL FIELD



Among the evidences of Canadian progress in 1928, none is more gratifying than that which again reveals, in stronger light than ever, the real worth of the Dominion as a field for mineral industry. The preliminary figures for the value of the country's mineral output, recently issued by the Dominion Bureau of Statistics, reach a peak well above any previous level.

There are two physical facts that carry a broad and special interest in connection with the steady ascent of Canada's mineral production in late years.

of research to the business life of the community or the country could not be estimated nor could anyone gauge what it would mean to the future of Canadian industry. He spoke of the efforts of the Dominion Government to create a national interest in the maintenance of the productivity of the forest and indicated that these efforts were bearing fruit in a universal desire to co-operate in this work so vital to Canada's national life.

With the unquenchable optimism of the Westerner, Mr. Stewart said that it required more than a slight slump in any given industry to alter his views as to its future. It was true that the pulp and paper industry was passing through a period of slight depression but the Dominion Government was seriously considering ways and means of relieving the situation. The Department of Trade and Commerce was looking for new markets for the products of the industry to take up the twenty-five per cent slack. The industry's foreign markets had been increased this year, further increases could be expected next year, and very soon the full output of the industry would be absorbed and at prices, he felt sure, that would be profitable to the industry.

Two years ago, the Minister remarked, he foresaw the results of the trend towards over-production and in the areas over which the Dominion Government had control immediate measures were taken to stop further expansion in the way of new mills and increased manufacture of pulp and paper. The matter had also been taken up by the premiers of the two great provinces, Ontario and Quebec, to which this industry was so important an asset.

Honourable Mr. Stewart in closing his

One is to be found in the sheer variety of minerals that enter into our annual output. In financial circles the wisdom of 'diversity of investment' is a byword, and it may well be said that Canada's strength as a mining field likewise lies largely in 'diversity'—in the fundamental fact that Nature has invested the Dominion with mineral assets which, in variety, are matched by few, if any, countries. It is to this wide range of resources that the Canadian mining industry mainly owes both its enjoyment of present prosperity and its assurance of stable, well-sustained growth.

remarks took the opportunity to thank the Pulp and Paper Association for their co-operation in making possible such splendid facilities for the furtherance of pulp and paper research and to say that he had no doubt successes would be achieved in the new Institute that would redound to the credit of the industry and to the individuals engaged in the work.

SAFEGUARDING CANADA'S NATIONAL TIMEPIECES

(Continued from page 2)

weighing about one and one-half tons and separated from the floor slab so that walking on the floor does not disturb the clock. Each of the rooms is kept at a temperature of 25° C. (77° F.) by carbon filament electric lamps which are turned on or off by a thermostat. Though not absolutely constant, the temperature is practically so, the variation for weeks being less than a tenth of a degree. As the clocks are self-winding and record their time electrically on a chronograph in the Observatory, it is never necessary to enter the vault except for occasional inspection and repairs. These clocks, mounted on their massive piers and enclosed in airtight cases from which the air has been partially exhausted, work under conditions as nearly perfect as can be obtained.

For more than a generation the blue ribbon of the horological world was held by the Riefler clock, manufactured in Germany. This make of clock is to be found in almost every observatory in the world. Within the last few years, however, the tide has turned, and the palm has again passed to Britain, where it originally belonged. The recently developed Shortt clock, manu-

A second physical fact of no less importance exhibits itself in the breadth of territory afforded by the Dominion as fair ground for more intensive prospecting. A major portion of Canada has so far been subjected only to cursory study, but even so, ample information has been gained as to the potential mineral wealth of the less known regions of the country to confirm the Canadian mining industry in its title to an ample field for further development.

factured in England, is conceded to be the last word in clocks, and it is doubtful whether any further advances will be made for another generation, if even then.

With its two existing Riefler clocks and a Shortt clock recently ordered, situated in the new clock vault, the Dominion Observatory will be second to none, and equalled by few, in the essential features of its time equipment.

CANADA GEESE INCREASE WHEN PROTECTED

Very rapid increase has taken place in the number of Canada geese in the Vaseaux Lake bird sanctuary, British Columbia, since this area was set aside for this purpose in 1923. In one part of the reserve, an island in the lake where only three geese nested in 1919, thirty-five nests were counted in 1928. Throughout the whole sanctuary the number of nests counted in the latter year was fifty-five whereas in 1923 the number of incubating birds was very small indeed. During last summer over four hundred geese were counted at one time.

Canada's Mining Industry

The variety of Canada's mineral deposits, the large scale on which operations are conducted, and the great extent of its mining lands, make it evident that the Dominion is a country of great mineral possibilities, that it is undergoing rapid development, and that it offers an attractive field for exploration and development companies.

PROGRESS OF GEODETIC SURVEYS IN CANADA

Review of Work Indicates How This Service Aids Industrial Development

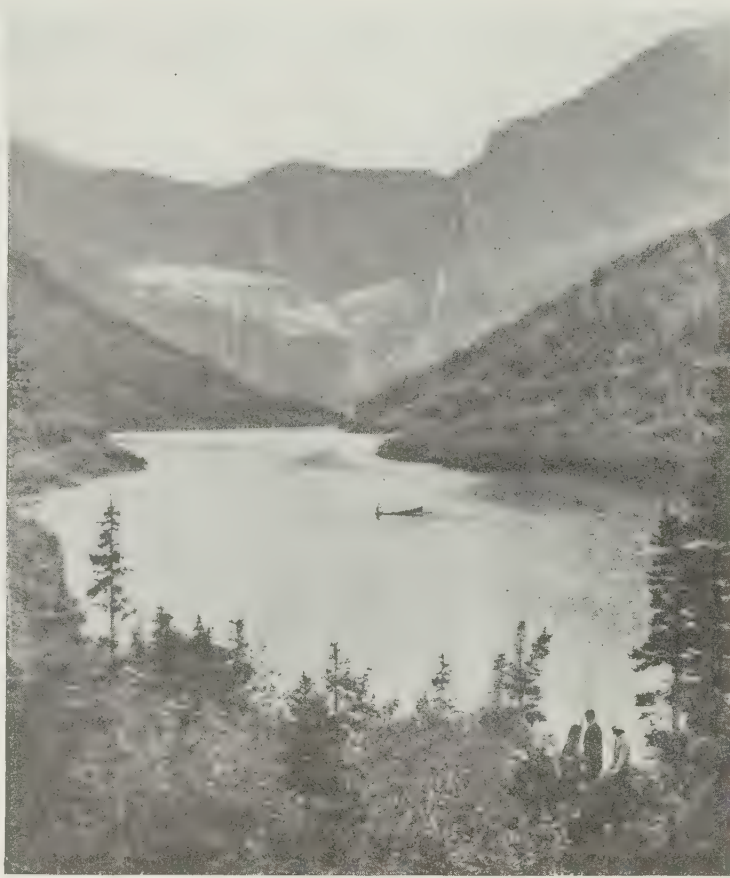
A review of the work of the Geodetic Survey, Department of the Interior, for the past few seasons indicates how this branch of the Federal Government aids industrial development by supplying accurate information as to latitudes, longitudes, and elevations above sea level of selected points in all parts of the Dominion. With regard solely to the accurate fixing of position which constitutes the major portion of geodetic survey work, the geodesist selects suitable points and ascertains where they are on the earth's surface and their relation to and distance from one another. This geodetic method of accurately ascertaining position is called triangulation. What lies between the selected points—rivers, lakes, arable lands, mineral lands, roadsteads, harbours, and the rest—must be plotted in by the topographical, geological, or hydrographic surveyor.

One of the first duties of the Geodetic Survey was the running of a network of points across Canada in the proximity of the International Boundary. In this it co-operated with the United States Coast and Geodetic Survey, and now a geodetic net extends along the border from the Atlantic to the Pacific and up the British Columbia coast to the southern boundary of Alaska.

While this operation was in progress Canada's industrial development was rapidly proceeding and railway, mining, and water-power enterprises were entering new areas. This increased the demand for important data as to latitudes, longitudes, and altitudes which it is the function of the Geodetic Survey of Canada to furnish. In laying out the program of work these developments were fully considered and surveying was done in different parts of Canada to meet the most urgent demands. A bird's-eye view of the operations of the past few seasons and those immediately in hand is instructive as showing that many names which occur in the Geodetic Survey program are those to which the eyes of the country are directed by reason of developments now proceeding.

Much work has been done in the Maritime Provinces. In the past few seasons this has been chiefly in south-western Nova Scotia and northern New Brunswick; from the latter area the net enters Quebec by way of the Matapedia valley. The St. Lawrence valley has been dotted with triangulation stations from the strait of Belle Isle to Montreal. A triangulation net has been run along the transcontinental line of the Canadian National Railways from the St. Lawrence to the western boundary of Quebec, embracing the whole of the Rouyn district and connecting with the net running up the Gatineau valley from the Ottawa.

From the Quebec-Ontario boundary the names that occur in the westward-extending net are Kirkland lake, Abitibi, Kamiskotia, Sudbury, and Nakina. The last named is on the transcontinental line of the Canadian National Railways about 260 miles west of Cochrane. This brings the work into the broken country about lake Nipigon wherein occur such familiar names as lac Seul and Red lake.



Extension and Improvement of Park Highways—An enchanting view of Bertha lake in Waterton Lakes national park, Alberta. Bertha lake, which is reached by a five-mile trail from the village, nestles at the foot of mount Alderson with Bertha mountain to the right. The trip to Bertha lake is a favourite one of trail riders visiting the park.

EXTENSION AND IMPROVEMENT OF PARK HIGHWAYS

(Continued from page 1)

dock in Buffalo national park. In Jasper and Yoho parks considerable maintenance work was done on highways and trails while the Mount Revelstoke motor road was extended to the lookout point at the summit, this being the final objective. This road, starting from the town of Revelstoke at an elevation of 1,492 feet, reaches an altitude of 6,215 feet in a total length of 18½ miles. In Elk Island park some much needed road construction was undertaken, a standard road being built from the north gate of the park to Sandy beach. The latter place is a very popular bathing and picnic resort.

A number of new bridges were erected along the main highways, while others were improved to meet the steadily growing motor traffic. In Jasper park an 89-foot single span bridge was built over the Miette river on the Edith Cavell motor road, and in Yoho park a bridge was constructed over the Ottertail river on the Field-Golden road. This latter has an 80-foot span and

The focus of operations in the Prairie Provinces is Edmonton from which station a line runs eastward through Prince Albert and around the north end of lake Winnipeg to eventually link up with the Red Lake-Lac Seul region of Ontario. Branches are also being run to connect with Brandon and the International Boundary on the south and Flinflon and Fort Churchill to the north and northeast. Edmonton is connected on the south, through Calgary and Medicine Hat, with the net along the International Boundary. Westward from Edmonton a network of triangulation will link up through Yellowhead pass with the extensive British Columbia Coast system by means of lines southwest to Vancouver and northwest to Prince Rupert.

clear width for vehicles of 17 feet 3 inches. The decks of three important bridges in the Kickinghorse canyon were extended to the standard width.

Considerable other important work was carried on in the national parks in the West. A start was made in Jasper townsite, Jasper national park, on a new sewer system, about one mile of fifteen-inch pipe being laid during the season. In Kootenay park, British Columbia, a new bath-house was completed at the Radium Hot Springs, ninety miles west of Banff. The swimming pool was also extended thirty feet and deepened to give a standard size of pool. One new hot spring was discovered when foundation excavation was under way. Provision was made in the lower concrete wall of the pool for an outlet to supply a small hydro-electric plant to serve departmental needs. The plant will utilize the hot spring water running from the pool, thus doing away with ice troubles in the winter months. Maintenance and extension work was also carried on in Banff, Waterton Lakes, Yoho, Glacier, Buffalo, and Elk Island parks.

In the eastern national park areas a large amount of work was done in connection with development and improvements. Two wharves to accommodate ferries were constructed at Broder and Cedar islands in the St. Lawrence Islands parks. Complete repairs were made to the Shoal martello tower in Kingston harbour. Extensive restoration work was carried on at Fort Chambly, Quebec, and other maintenance work done at Fort Howe and Fort Beauséjour in New Brunswick.

Canada's Experimental Farms

The Dominion Experimental Farms system of the Department of Agriculture stretches across Canada from the Atlantic to the Pacific, and is the most comprehensive system of its kind to be found in the world.

POINT ROBERTS, B.C. BOUNDARY MONUMENT

Granite Shaft Marking Western Terminus of International Boundary Has Stood for 67 Years

The large boundary monument on Point Roberts on the eastern shore of the strait of Georgia, British Columbia, which marks the western terminus of the land boundary along the 49th parallel between Canada and the United States, was erected in 1861. This monument stands twenty feet high and is constructed of massive granite blocks. Due to the high price of labour at that time and place, the monument cost nearly \$5,000 but its present excellent state of preservation after a lapse of sixty-seven years is evidence of the care and skill with which it was erected.

In 1818 it had been agreed that the 49th parallel should form the International Boundary from the lake of the Woods to the summit of the Rocky mountains. In 1846 it was further agreed that the 49th parallel should also be the boundary from the latter point to the middle of the channel which separates Vancouver island from the mainland. The original surveys of that portion of the International Boundary from the summit of the Rockies to the coast were begun in 1857 and finished in 1862 when a boundary vista was cut through the woods and marked with monuments in the more accessible districts. The task of maintaining the entire International Boundary between Canada and the United States in a state of effective demarcation was entrusted to the International Boundary Commission by a treaty signed at Washington in 1925 by representatives of the two countries.

COMPLETE SURVEY SOUTHERN PART OF MUSK-OX PRESERVE

(Continued from page 1)

It had been arranged that the investigators were to visit the post of Baker Lake to receive and despatch mail and to secure supplies. This post is situated at the western end of the lake of the same name which empties into Chesterfield inlet, thus forming a navigable waterway to Hudson bay. The route Messrs. Hoare and Knox were to follow was through the Ford-Campbell-Smith chain of lakes to the Thelon and down that river to Baker lake. However the investigators report that these lakes are not connected as shown on the map and since they were unable to reach Baker Lake during the open season it was decided to explore the southern part of the park and later return to their base at Fort Reliance. They reached that point in mid-December and shortly afterwards a Royal Canadian Mounted Police patrol brought Mr. Hoare's report to Fort Smith from which post it was telegraphed to Ottawa.

The report received also stated that early in February of this year Messrs. Hoare and Knox would resume their detailed examination of the Thelon preserve, working over the northern portion during the coming summer. They will travel eastward and pick up at Baker Lake the supplies and letters left there for them last year, and it is expected that their survey will be concluded early next autumn.

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CANADA'S FOREST FIRE SITUATION IMPROVED IN 1928

LOW FIRE HAZARD IN SOUTH AND EAST

**But Continued Drought Caused Serious
Conditions in Northwest—4,259 Fires
Were Reported**

The forest fire situation in Canada during 1928 may on the whole be considered as having been satisfactory. There were marked contrasts in fire hazard conditions between the eastern and southern portions of the Dominion and the northwestern areas. Although the compiled weather bureau records show that last year was the wettest with one exception in 39 years, nevertheless drought conditions of almost unparalleled duration prevailed in a wide belt extending from northwestern Ontario across the northern parts of Manitoba and Saskatchewan into Alberta. In this area the normal hazard was greatly increased by the travel resultant from the extensive mining activity.

During the calendar year 1928, 4,259 fires were reported in Canada. These burned over an area of 1,347,170 acres, causing a total gross damage and loss of \$1,328,950. The latter figure is an improvement over the previous low record year of 1927, even though the total area burned over last year greatly exceeds the 1927 figure.

The following table compiled by the Forest Service, Department of the Interior, from returns made by the different forest authorities gives in detail the figures for the year 1928 (subject to further slight revision) as compared with the average for the five-year period 1924-28 inclusive.

Item	1928	Average 1924-1928 Incl.
Total number of fires...	4,259	4,934
Total area burned over (acres)	1,347,170	1,506,200
Merchantable timber—		
Area burned (acres) ..	217,451	316,803
Timber burned (M. ft. B.M.)	364,550	1,450,433
Estimated stumpage value. \$	417,883	\$2,538,027
Young growth—		
Area burned (acres) ..	374,155	465,714
Estimated value	\$ 508,419	\$ 927,778
Cut-over—		
Area burned (acres) ..	59,631	173,337
Estimated value	\$ 49,995	\$ 104,992
Non-forested—		
Area burned (acres) ..	674,134	544,412
Other property burned—		
Value	\$ 147,288	\$ 509,637
Actual cost of fire fighting. \$	205,365	\$ 573,489
Total gross damage and loss	\$1,328,950	\$4,463,581

Maritime Provinces—In New Brunswick and Nova Scotia, conditions were similar. A total of 234 fires occurred which burned over an area of 6,451 acres resulting in a combined loss of \$3,422,
(Continued on page 4)

CANADA'S TOURIST POSSIBILITIES

**Greater Attention Being Given to Development of Traffic—
Dominion's Varied and Unrivalled Attractions**

One of the notable features in Canada's commercial development in recent years has been the increased attention and active aid directed to building up the country's tourist trade. The Department of the Interior has long been closely associated with this phase of our national economic life; its investigatory work relative to the development of the natural resources of the country

surpassed in 1928. Briefly, tourist travel brings to Canada an income comparable with the value of either the country's pulp and paper or mineral production.

As already pointed out, the work of developing tourist traffic fits logically into the general work of the Department of the Interior. But the Department is not alone in this feature of Canadian development. The railway and steam-



Canada's Tourist Possibilities—An alluring scene in the Maritime Provinces. Anglers trout fishing in the renowned Lake Rossignol section of Nova Scotia.

places it in a position to supply valuable information along the line of tourist inquiries and to issue material that promotes the development of tourist travel. For a number of years the Department has been conducting a vigorous campaign to bring Canada to the attention of prospective tourists and to extend tourist business as a constructive public activity that contributes largely to the national income and development.

That this work is bearing much fruit is evidenced by the fact that tourist travel is fast becoming one of the important industries of the Dominion. The growth of the traffic is most strikingly indicated by the increase in tourist automobile entries. In 1928 a total of 3,645,455 tourist cars entered Canada, as compared with 3,153,800 in 1927, an increase of upwards of 500,000 cars. The expansion of tourist travel to Canada via railway and steamship lines has been remarkable in recent years, and while it is officially estimated that the value from all classes of the traffic reached \$242,754,000 in 1927, reports from reliable sources throughout the country indicate that this expenditure was far

ship companies have played a very important part in directing attention to tourist attractions, particularly along their respective routes. Well organized provincial and local tourist bureaus have also been active.

With such magnificent and varied natural scenery combined with ideal summer and autumn conditions and accommodation to meet the requirements of practically all classes, Canada offers the vacationist an unlimited range of attractions each having a strong appeal. The natural advantages which the country holds for the canoeist, the camper, the motorist, the angler, or those seeking recreation and health, are unique. Each year increasing numbers enjoy the scenic beauty of Canada's vast lakeland districts, her forested areas and majestic mountain ranges, which are surpassed by no country in the world.

One of the most historic and picturesque parts of the Dominion is comprised in the seaside provinces of Nova Scotia, New Brunswick, and Prince Edward Island. The distinctive recrea-

(Continued on page 3)

BY DOG SLED AND CANOE THROUGH THELON SANCTUARY

EXPLORERS HAD MANY TRYING EXPERIENCES

**Department of the Interior Party Continues
Examination of Northwest Territories
Preserve**

The full report of the survey of the southern portion of the Thelon game sanctuary, east of Great Slave lake in the Northwest Territories, has been received in the Department of the Interior at Ottawa from Mr. W. H. B. Hoare, explorer of the North West Territories and Yukon Branch, who recently completed the work and is now engaged in an investigation of other parts of the preserve. The patrol and intensive examination of this area is being made with a view to discovering the number of musk-ox and other game animals in the 15,000 square mile preserve, what measures should be taken for their protection, and to lay out routes and locate sites for cabins for a proposed warden service.

The report relates the experiences of Mr. Hoare and his companion, Warden A. J. Knox of Fort Smith, N.W.T., during their trip from the base camp near the Royal Canadian Mounted Police post at Fort Reliance, at the east end of Great Slave lake, through the preserve to the junction of the Hanbury and Thelon rivers, and return. For eight months they were out of touch with civilization, battling against blizzards, flood, and cold and much of the time on short rations. Inaccuracies in the only available map of the region caused considerable delay and the party had to abandon a proposed visit to Baker lake for supplies and were forced to return to the base at Fort Reliance.

Mr. Hoare, with a dog team of six Baffin Island huskies, left Ottawa early in January, 1928. He travelled by rail to McMurray, Alberta, and there began the 800-mile journey by dog-team to Fort Reliance, N.W.T. At Fort Smith, he was joined by Warden Knox with an additional dog team and the arduous journey to the east end of Great Slave lake was continued. The trip was made via Resolution, where a halt had to be made for nine days to allow the dogs to recover from the strain of the journey. The Royal Canadian Mounted Police post was reached on March 5 and here a canoe shipped in the previous season was added to the equipment and carried on one of the sleds for use in summer travel. On May 10 the first camp was pitched within the preserve on the east shore of Artillery lake.

Cold weather, blizzards, freezing rain, and a quick thaw made travel conditions

(Continued on page 2)

CANADA INTERESTED IN U. S. BIRD LEGISLATION

Dominion Concerned About Winter Feeding Grounds in South for Migratory Birds

Canada is directly concerned in everything that affects the protection of bird life in the United States because, unless migratory birds have a resting place in winter, there will soon be none left to fly north in spring and our great breeding and nesting areas will be left untenanted. The announcement that the United States Congress had passed the Norbeck-Andresen bill, appropriating \$8,000,000 for the purchase of marsh lands to be used as bird sanctuaries, aroused more than usual interest in this country and Hon. Charles Stewart, Minister of the Interior, whose department is charged with the administration of the Migratory Bird Treaty, being asked to comment on the nature and purpose of the Act, made the following statement:—

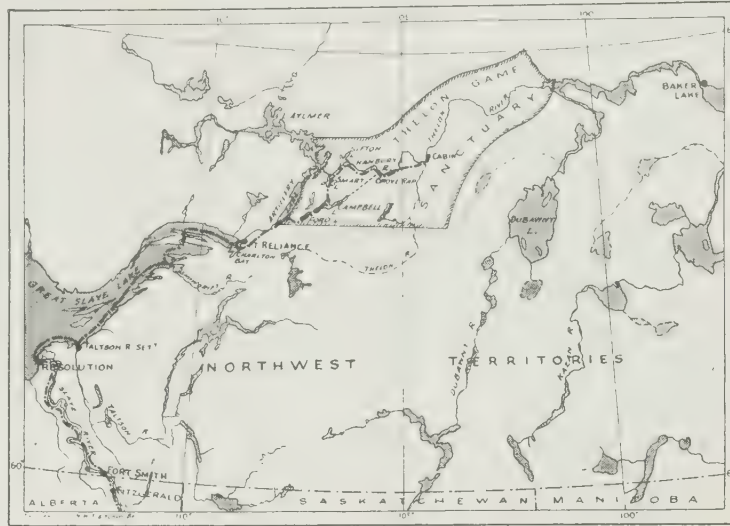
"Agricultural expansion and other developments in the southern United States, where most of Canada's waterfowl spend the winter, have gradually been encroaching upon the marsh lands there, and those interested in wild life conservation in the United States have been trying for some years to find an adequate solution of the problem of providing these birds with suitable wintering marshes. Apparently the passage of the Norbeck-Andresen bill by Congress is the answer that has been sought. If the waterfowl are denied suitable wintering marshes they will become extinct in spite of all that Canada can do to protect them in summer, for the birds go south in winter. Sportsmen and bird lovers of Canada will be delighted that this action has been taken under the Migratory Bird Treaty by Congress, and that this Bill provides for a series of inviolable bird sanctuaries in the south.

"With reference to the Dominion's action in this matter, I am happy to be able to say that Canada has reserved forty bird sanctuaries under the Treaty, and in these the summer homes of seabirds on the coasts and of ducks and geese in the interior are protected. In addition to these sanctuaries fifty-one public shooting grounds have been set aside. These are great marshes where waterfowl nest safely during the breeding time, and which differ only from total sanctuaries in that shooting is allowed on them for a set time each fall.

"Other benefits secured under the Treaty, I may add are total protection for Canada's insect-eating birds, which help to protect crops and forests from insect pests; the total prohibition of spring shooting, so that our migratory birds can come north on their way to the breeding grounds without molestation; and the universal prohibition of the sale of migratory game birds, in the United States."

Growth of Tree-planting

In connection with the distribution of trees to prairie farmers in Canada which is made annually by the Tree Planting Division of the Forest Service, Department of the Interior, it is interesting to note that each spring nearly 8,000,000 young trees are sent out; shipment of these trees require 2½ carloads of moss and nearly 10 miles of 45-inch burlap. Before many years are gone, the "treeless prairie" will be a thing of the past.



Survey of Thelon Game Sanctuary—Map of a portion of the Northwest Territories showing the Thelon game sanctuary (in the hatched outline) and the route followed by Messrs. W. H. B. Hoare and A. J. Knox during their examination and patrol of the southern part of the preserve. The route is shown by the dotted line from Fort Smith in the lower left hand corner, along the shore of Great Slave lake to the centre of the sanctuary.

BY DOG SLED AND CANOE THROUGH THELON SANCTUARY (Continued from page 1)

very disagreeable and the trip eastward in the sanctuary to the Ford-Campbell-Smart chain of lakes was slow and laborious. It was not until June 9 that, all supplies having been moved to Ford lake, a start could be made by canoe eastward.

Ford lake is reported as larger than as shown on existing maps, being approximately 15 miles in length and having a number of deep bays. Many fish were seen in its clear water and the verdant valleys in the vicinity afford pasturage for large numbers of caribou at certain times of the year. No caribou were seen in the district from the first week in June until July 20. Then a migration of at least ten thousand passed the party's camp, moving westward. Throughout the remainder of the summer caribou were numerous in the territory passed through.

A three-mile portage took the party from Ford lake to Campbell lake and on July 24 the explorers started along Campbell lake to find the arm that was supposed to connect with Smart lake. The lake was found to be about 35 miles long, very irregular in shape, and with many deep arms. Two trips around the lake, careful examination of the shore line, and excursions overland failed to reveal any connection between Campbell and Smart lakes. The nearest approach of the two lakes to one another was found to be about 12 miles, the route involving 16 portages covering a distance of nearly three miles.

The party passed through Smart lake and proceeded down the Hanbury river to its junction with the Thelon. This point, where it had been planned to build a warden's cabin, was reached on October 19. Ice was forming in the lakes and rivers at this time. The investigators immediately started work on the cabin but before it was completed the food supply began to run low. Ice running in the rivers made it impossible to catch fish and the question of food became a serious one. The investigators had to share their meager supply with the dogs and short-rationing was resorted to to conserve the supply, while the work on the cabin was rushed to completion.

On November 22 the party left the Thelon base on the return trip to Fort Reliance as it was imperative that food be soon secured. A herd of musk-ox and the tracks of a second herd were

seen on the banks of the Thelon but of course the animals were not disturbed. Reaching Grove rapids, meat in a cache there was picked up and both men and dogs recuperated their strength during the three days they were stormbound at this point. The last lap of the journey, with the food supply uncertain and weather conditions becoming worse each day, is graphically told in the following extract from the report:—

"Striking overland from Grove rapids on November 28 we reached Campbell lake on December 1 in a blinding storm. The storm held us up for two days and the fuel oil became almost exhausted while food ran so low that we had to exist on soup. On December 4 we pushed on to the west end of the lake and camped among some small spruce which provided us with much needed fuel to dry out our frozen sleeping sacks and clothing.

"On December 5 the very last of our food was eaten for breakfast. We crossed the three-mile portage to Ford lake then went eight miles down the lake and found the supply cache intact. The supplies proved most welcome and the famished dogs were given a good feed. Next morning we went on in a blizzard to the southwest end of Ford lake and there had to take shelter in a snow bank. That day about twenty caribou were seen.

"December 7 saw us again on the way. The remainder of the journey to Fort Reliance was made in easy stages and we arrived at the Police detachment on December 13."

After resting the dogs and securing a renewal of supplies and equipment, the party started back early in 1929 to explore other portions of the Thelon sanctuary and, it is expected, that Mr. Hoare will return to Ottawa next autumn, coming out by way of Baker lake and Hudson bay.

Waterton Lakes Park is Popular

Although for over a quarter of a century Waterton Lake national park has formed a holiday paradise for residents of southern Alberta, until recent years it has been almost unknown to the travelling world. With the advent of the motor and the building of good roads connecting the park with main provincial highways, this beautiful reservation has come into its own and each year an increasing number of visitors enjoy its many attractions.

EXTENDING CANADA'S AIR MAIL SERVICE

Plane Makes Successful Flights to Points in Mackenzie Valley, Northwest Territories

Modern improvements in means of transportation and communication are playing an increasing part in the extension and improvement of Canada's mail service. Early this year both the aeroplane and the radio were utilized for the inauguration of a new service to ameliorate the postal isolation of the inhabitants of the Northwest Territories.

In January Hon. P. J. Veniot, Postmaster General, learned that the Western Canada Airways Company had arranged a schedule of ten flights down the Mackenzie from Waterways, Alberta to Simpson, in the Northwest Territories. Pilot C. H. Dickens had been detailed for the work in a Fokker plane equipped with skis. The Postmaster General immediately made arrangements to take advantage of this circumstance. Considerable mail had accumulated at McMurray, near Waterways, to be transported by dog-team; and authority was granted to move this mail by plane on one or more trips.

In order to complete arrangements for the new service, radio messages were sent out from Edmonton to the postmasters at the different posts at which it was intended to call and in this way preparations for the speedy handling of the mail were completed. On January 23 Pilot Dickens left McMurray at 12.50 p.m. in his Fokker plane and reached Fort Smith at 5 o'clock the same day. At 10.30 a.m. on the 25th he continued on to Simpson which was reached the morning of the next day, having remained overnight at Providence. Unfavourable weather prevented the commencement of the return flight until the morning of January 27. The plane flew from Simpson to Resolution on Great Slave lake and completed the 400-mile trip from that point to McMurray in 2 hours and 40 minutes.

On February 6 a second trip was made with a capacity load, leaving McMurray at 8.15 a.m. proceeding to Resolution and returning to McMurray at 4.10 p.m. First class mail from Resolution, Fitzgerald, and Fort Smith was brought out on the return trip.

All the accumulated mail at McMurray was moved, and the success attending these operations induced the Postmaster General to authorize another flight from McMurray to take accumulated mail from intermediate points to posts farther north—Wrigley, Norman, and Good Hope—a total distance of 1,293 miles. This was safely carried out during the first week in March.

Similar services in Northern Canada were those being carried on between Whitehorse, Mayo, and Dawson in Yukon Territory. Up to January 18, nine round-trips had been made this winter, and the speed with which the services have been performed is again in striking contrast to that of the tractor and horse-drawn equipment used until recently.

Striking evidence of the appreciation of these outlying places is afforded by a letter of thanks sent to the Postmaster General by the white residents of Resolution, N.W.T., in which they point out that the air mail service has given them more mail in two trips than they had received during the last four winters by ordinary means.

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OTTAWA, APRIL, 1929

CANADA'S TOURIST POSSIBILITIES

(Continued from page 1)

tional attractions of these provinces include scenic rivers and lakes, famous for their salmon and trout; easily accessible hunting areas; beautiful marine views; good motor highways; and delightful summers and autumns. Ontario and Quebec, Canada's great central provinces, stretching from the International Boundary northward to James and Hudson bays cover an immense and diversified territory. First-class railway and steamship accommodation, excellent motor highways and a network of rivers and lakes provide a generous transportation system. The great Laurentian upland which occupies most of Ontario and Quebec is a country of forest and stream, of hunting, fishing, canoeing, and camping. It is a country of rare natural charm and the extensive areas of forest reserves and provincial parks offer a splendid field for study of wild life. In addition one is always assured of pleasantly warm days and cool evenings during the summer and autumn seasons.

The prairie country, which forms a broad belt across the southern portions of Manitoba, Saskatchewan, and Alberta, though less known for its attractions than for its productiveness, and its endless miles of golden grain, has an appeal all its own—there is a spaciousness which gives the idea of freedom, youth, and rapid development. The northern areas of these provinces abound in rivers, lakes, and forests, which offer the angler good fishing, and the sportsman excellent opportunities for hunting birds and big game. Alberta shares with British Columbia the possession of some of the most famous mountain scenery in the world, much of which has been preserved in the immense areas which have been set aside as national parks. British Columbia, Canada's most westerly province, is by reason of her enormous wealth of forest and fishery, marvellous and magnificent mountain ranges, and majestic rivers, a recreational country of great attraction. This province offers the angler various species of salmon and trout and in addition its vast mountain regions are natural breeding grounds for numerous varieties of game animals. Scenic motor routes in both Alberta and British Columbia link up with highways of the United States and Canada's Middle West and enable the visitor to view some of

NAME OF DOG PORTAGE —HISTORY OF ORIGIN

Several Interesting Explanations Recorded
by Geographic Board of Canada

One expects to find throughout Canada lakes and rivers with such names as Whitefish, Sturgeon, Trout, Otter, and Beaver, implying that the waters in question are the habitat of these animals. Almost as numerous as these are the lakes and rivers bearing the name, Dog, but why they should be so called is not apparent. One outstanding example is that on one of the fur traders' routes to the West from lake Superior which ascended the Kaministiquia river from Fort William, Ontario, crossed Dog portage to Dog lake and continued up Dog river. Several explanations have been given for this application of the name according to a report of the Geographic Board of Canada.

The first known reference to Dog portage is as "portage du chien" in an account by the Intendant Begon dated 1716 of a journey up the Kaministiquia river to lake of the Woods made in 1688 by Jacques de Noyon. The earliest explanation found by the Geographic Board was contained in the diary of a fur trader who, under date of June 16, 1816, states that the name commemorates a tribe of Sioux who came to the region on a war expedition. He adds that the image of a dog is cut in the ground on one side of the portage and at that time was still perfectly visible.

Keating, the United States traveller who crossed the portage in 1823, explains the name as due to the figure of a dog carved upon the hill over which the trail passes, and adds that "this figure is nearly obliterated." Keating notes that "it is supposed to have been executed by a party of Sioux who had advanced thus far on a war-like excursion".

Sir George Simpson, Governor of the Hudson's Bay Company who travelled west by this route in 1841, agrees that the name was first applied to the portage. He states that according to the traditions of the natives, two enormous dogs having taken a nap at the top of the hill on the portage, left the impress of their bodies behind them, "and certain it is" he concludes, "that such figures have been marked on the turf".

the world's most renowned beauty spots in the Rockies, with their snowcapped peaks, enchanting valleys, and jewel-like lakes.

Yukon Territory, in the last five years, has come to the front as one of Canada's tourist regions pre-eminent in certain characteristics. Lines of well-equipped steamships and railways take, each season, an increasing number of tourists to this land of the midnight sun. Big game is one of the major attractions, and the short, pleasant summer, the profusion of wild flowers, the outstanding scenery, and the prolonged hours of daylight, are sources of wonder and delight to the many visitors. The Northwest Territories has hitherto been a great unknown land but already the advance of settlement and commerce has provided facilities which enable the tourist to follow in comfort in the footsteps of Mackenzie and other early explorers down a magnificent system of waterways to the Arctic ocean itself.

MINING ACTIVITIES IN NEW BRUNSWICK*

Renewed Interest in Mineral Possibilities
of Province—Investigate Known
Metal Deposits

Renewed activities in metal mining in New Brunswick during the past year and increasing interest in the mineral possibilities of this province are referred to by Dr. F. J. Alcock, of the Geological Survey of Canada, in a statement recently issued by the Dominion Department of Mines. Although much of the territory has never been prospected, occurrences of gold, silver, copper, lead, zinc, antimony, iron, and tungsten are known, and Dr. Alcock points out that increased development of known ore deposits and a stimulated search for new ones may result in New Brunswick taking her place among the metal producing provinces of Canada.

During 1928 exploratory work was carried on in different parts of the province by a number of companies. Investigations were made into the economic possibilities of a copper prospect near Annidale, a copper showing near Goschen, and a copper-zinc deposit near New Ireland, and surface work was conducted on the Lumsden property, Albert county, carrying gold, silver, zinc, and copper. Attention was directed also to the Lake George antimony deposits about twenty-five miles southwest of Fredericton.

A copper-nickel deposit near St. Stephen and a copper occurrence on Adams island were examined by a local group, and a showing of native copper near Marriown was investigated by Montreal interests. Other work in the province consisted of mineral investigations carried on by the Development Branch of the Canadian National Railways in northwestern New Brunswick, and exploratory work on zinc-lead showings in Restigouche county and copper prospect in St. John county.

*Prepared at the direction of Dr. Charles Camsell, Deputy Minister, Department of Mines.

PETROLEUM PRODUCTION FROM ALBERTA'S FIELDS

January, 1929, Figures Show Increases in Most
Grades Over Same Period Last Year

The total production of petroleum in Alberta in January, 1929, was higher than that for the corresponding period last year according to a statement compiled in the Department of the Interior from returns received from the operators. The following table gives the comparative figures for the two periods by grades:—

	Naphtha (bbls.)	Crude (bbls.)	Crude (bbls.)	Total (bbls.)
January, 1929.	33,197	7,431	129	40,667
January, 1928.	27,638	5,596	494	33,728

Park Animals are Fearless

Wild life conservation measures adopted and enforced in the National Parks of Canada have resulted in the wild creatures losing much of their fear of man. It is no uncommon occurrence to encounter wild deer on the streets of Banff townsite, in Rocky Mountains park, Alberta, while Rocky Mountain sheep graze alongside certain sections of the park highways, undisturbed by the passing motor traffic.

VIEW WORK OF FOREST PRODUCTS LABORATORIES

Members of Engineering Institute Visit
Department of the Interior's Main
Laboratories

On the occasion of a recent monthly meeting, the members of the Ottawa branch of the Engineering Institute of Canada to the number of about 110 visited the main laboratories in Ottawa of the Forest Products Laboratories, Department of the Interior, and spent several hours viewing the modern equipment and studying the methods of work of that institution.

After a brief introductory explanation of the purposes and work of the laboratories, by Mr. T. A. McElhanney, the Superintendent, the party inspected the various departments where the operations in progress were explained by the divisional officers. Practical demonstrations were given in timber mechanics, one of the chief attractions being the timber-testing machine which is the only one of its kind in Canada. Another wonderful contrivance seen in action was the hazard tester, a huge revolving drum which determines the amount of resistance crates and boxes of different sorts and sizes exert against careless and reckless handling. Standard specimens of forest products, such as cellulose derivatives, resin, and oil were exhibited and fully described; the processes of wood-preserving by creosoting ties and timber, together with the financial and structural advantages of the various processes were explained in detail; and an examination was made of the timber pathology display. The tour concluded with an interesting series of slides on timber physics.

The main laboratories in Ottawa include in their work the mechanical testing of timbers, the utilization of wood waste, the study of wood decay, wood structure, the measurement of fibre lengths, the adhesive strength of wood glues, the holding power of nails and screws, the design of wooden containers, the preservative treatment of woods, the relative properties of different preservatives, the seasoning of wood either naturally or in dry kilns, the distillation of hardwoods, and many other related problems.

It may be stated that in addition to the main laboratories at Ottawa, there are branches in Vancouver and Montreal. The Vancouver branch deals with Pacific Coast woods, and the Pulp and Paper Division in Montreal is devoted to scientific research in that field. The Montreal laboratory, the work of which is carried on co-operatively by the Department of the Interior, the Canadian Pulp and Paper Association, and McGill University, is housed in the new Pulp and Paper building recently opened by His Excellency the Governor General.

The Kicking Horse Trail

The Kicking Horse Trail commences at Lake Louise, in Rocky Mountains national park, Alberta, crosses the Great Divide and follows the Kicking Horse river to Field, British Columbia, Yoho park headquarters. From here access is easy to the beautiful Yoho valley. The road then continues along the Kicking Horse canyon and on to Golden, British Columbia. This motor way, which is the second transmontane highway to be built across the Central Rockies, unlocked the gates of Yoho park to the outside motor world.

PRAIRIE INDIANS MAKE GRATIFYING PROGRESS*

Continued Advance Noted in Farming and Stock-raising on Western Canada Reserves

In keeping with the generally prosperous conditions which prevailed throughout Canada during 1928, Indians on reserves in the three Prairie Provinces continued their steady progress toward a condition of self-support and independence. Very satisfactory reports have been received on the advancement made by the natives in their various activities but the most striking is that made in agriculture. Notwithstanding severe losses suffered through inclement weather, the total yield of grain from Indian farms in the West was estimated at over one million bushels (the greater part of which was wheat) while conspicuous successes were also scored in cattle raising and in other farm activities.

According to recent reports of the Department of Indian Affairs the Indians in Manitoba, Saskatchewan, and Alberta have under cultivation 105,000 acres of land, having increased their total during the past summer by breaking 6,000 acres of new land and summer-fallowing 33,000 acres. The major part of this large acreage is sown to grain. Gardening is being more generally practised and many of the reserves boast some fine plots of vegetables.

The cattle herds of the prairie Indians are among the best in Western Canada due to the fact that unusual care has been taken by officers of the Department in the selection of the sires, which in most cases are paid for from the Indians' own money. The herds now number 22,500 head, which includes an increase this year of approximately 5,000 calves. During 1928 the Indians sold beef cattle to the value of approximately \$184,000 and in addition they provided beef for their own requirements valued at \$40,000.

The high standard of the Indians' herds is shown in the success of entries made at feeder and stocker shows during the summer and autumn of 1928. First prize for the best car of steers, Shorthorn breed, and second prize in the class for carload lots of three-year-old steers of any breed, were captured by entries from the reserves.

It has only been in recent years that the Indians have shown a lively interest in their cattle but successes in open competitions and the good returns from their herds have resulted in increasing the attention given to this phase of agriculture. In northern Alberta and in Saskatchewan and Manitoba the cattle are stabled or put in shed shelters and fed hay during the winter months, which means that a large quantity of hay and green feed must be cut each summer. During the past year 70,000 tons of feed was cut and stacked for use during the winter season.

Good, heavy horses are rapidly replacing the pony type among the Indians of the West. Nearly all of the farming Indians own fine work horses, of which there are about 8,000 on the different prairie reserves. There are about 15,000 of the pony type of horse. Horses to the value of over \$10,000 were sold from the various reserves during the season of 1928. More interest is also being shown in the raising of poultry and pigs.

The situation among the Indians on reserves in the three Prairie Provinces is most gratifying and the efforts of the Federal officials in charge of Indian Affairs are reflected in the general advancement. Increasing interest is being shown in every phase of agriculture

*Prepared at the direction of Dr. Duncan C. Scott, Deputy Superintendent General of Indian Affairs, by Mr. W. M. Graham, Indian Commissioner.



Exploring New Scenic Wonderland in Jasper—A view of Tonquin valley in Jasper national park, Alberta, with Amethyst lake in the foreground and the Ramparts rising in the distance. Tonquin valley is one of the recently discovered beauty spots of Jasper.

due in a large measure to the number of young Indians graduating from the various schools who are taking up farming.

CANADA'S FOREST FIRE SITUATION IMPROVED IN 1928

(Continued from page 1)

the lowest on record for these provinces. This comparatively negligible loss is attributed to the favourable wet season which prevailed, the permit system in vogue, increased effectiveness of the protective organizations, and a growing appreciation on the part of the public of the need of forest conservation.

Quebec and Ontario—In Quebec, all previous records were broken by the small number of fires which occurred and the low fire losses sustained. This province benefited undoubtedly by a favourable wet season. Nevertheless, the fire protection organization, working in conjunction with the several fire protective associations, was successful in extinguishing numerous fires in the incipient stage.

In Ontario, although the area burned over was nearly three times as great as in 1927, 86 per cent of the losses occurred in the Patricia district in the north-western portion of the province and largely beyond the aerial patrol system. This region experienced a particularly prolonged dry period, and 85 per cent of the fires which occurred are attributable to the camp-fires of prospectors.

The total number of fires in Quebec and Ontario last season was 831. The total area burned was 106,916 acres, by far the greater part being in north-western Ontario.

Prairie Provinces—In the southern portions of Manitoba, Saskatchewan, and Alberta, favourable weather prevailed, whereas in the northern forest areas of these provinces exactly the opposite conditions obtained. On the whole, Alberta reports a fairly satisfactory season. No timber was destroyed south of the latitude of Edmonton, but a number of serious fires occurred north of that point, chiefly in the settled districts. Manitoba and Saskatchewan each experienced one of the severest fire seasons on record. This was due to the light snowfall of the previous winter followed by a prolonged drought which lasted from April to December in the northern forest areas, and to the presence of thousands of prospectors, attracted by the extensive mining development in this region. Neglected camp-fires accounted for the majority of the outbreaks which occurred. In all 1,050 fires were reported in the Prairie Provinces which burned over

an area of 1,109,881 acres. More than half of this consisted of non-forested areas. Nevertheless, the total damage to timber and young growth amounted to \$780,521. The fire season was exceptional in that it continued from April to the end of December, during which period outbreaks were being continually reported which required suppression action. In these extensive northern areas aircraft offer the only efficient means of fire protection, and it was chiefly due to the excellent service rendered by aircraft that numerous outbreaks were detected in the incipient stage and controlled before great damage occurred.

British Columbia—In British Columbia, the high temperature and lack of precipitation from early May until late September created a fire hazard which required constant attention of the forest protective organizations in this province. In all, some 2,144 fires were reported, 80 per cent of which were extinguished in the incipient stage. The total area burned over was 123,912 acres and involved a total loss and damage of \$271,185, which is slightly in excess of the figure for the previous year. Favourable reports were received from this province of co-operation given by organized industry and also of an increased appreciation on the part of the general public of the efforts of fire-fighting organizations.

Dominion Parks in Ontario

There are two national parks in Ontario—the St. Lawrence Islands park and Point Pelee. The former is a recreational area, while the latter is a bird sanctuary and holiday reservation. Point Pelee is situated in lake Erie and is the most southerly point in Canada.

Our Mineral Development

Owing to the present vigorous development of the mineral wealth of Canada, a large share of the work of parties sent out by the Geological Survey, Department of Mines, this season will be concerned with the examination of mineral occurrences and promising areas for prospecting within range of means of transport and industrial development.

Many Occurrences of Salt

Salt, either in natural brines or in beds of rock salt, is found in every province of Canada. Commercial production, however, is confined to Ontario, Nova Scotia, and Alberta.

SURVEYING NEW SCENIC WONDERLAND IN JASPER

Topographical Engineers Map Brazeau and Sunwapta Areas of this National Park

The Department of the Interior in accordance with its policy of opening up and developing the national parks of Canada has during recent years carried on surveys in unmapped portions of Jasper National Park, Alberta.

As is well known, when Jasper national park was set aside in 1907 it comprised, outside of the Athabaska and Miette valleys, a vast mountain wilderness penetrated only by a few old Indian trails. Many of its now greatest regions such as Maligne lake and the Columbia ice-field were little more than a rumour, while Tonquin valley was entirely unknown.

In 1915 Mr. M. P. Bridgland, of the Topographical Survey, Department of the Interior, surveyed the central portion of the park, discovered the Tonquin valley, and as a result of his observations the Department issued the first map of the central portion of the park. During the survey of the British Columbia-Alberta boundary in 1917-1921 a great deal of new territory was explored and mapped on both sides of the Divide. In the eastern and northern sections of the park, however, great areas still remain unsurveyed, unmapped and even wholly unknown. Last year the Minister of the Interior authorized the undertaking of work by the Topographical Survey Branch in these regions. A party, under Mr. M. P. Bridgland, D.L.S., accordingly, spent the summer in the area adjoining the headwaters of the Brazeau and Sunwapta rivers and mapped 400 square miles of hitherto unexplored territory.

Some idea of the labour involved may be drawn from the fact that eighty-four combined camera and triangulation stations were occupied, as well as five additional stations for triangulation only. Of these stations twelve were over 10,000 feet above sea level while thirty-six others were over 9,000 feet. The triangulation was commenced with Nigel peak, 10,525 feet and Sunwapta peak, 10,365 feet, two of the British Columbia-Alberta Boundary Survey stations.

All the area surveyed was within the park or adjacent to its boundaries and it was found to be very plentiful in game. Bear, moose, elk, deer, sheep and goat were seen in numbers. In the upper part of the Brazeau valley the timber has been very little touched by fire. The valley inside the higher ranges is over 5,000 feet above sea level and the main peaks range from 9,000 to 10,000 feet elevation.

This new territory is an ideal spot for tourists, as the Brazeau valley is a natural camping ground plentifully supplied with wood and water and excellent feed for horses. The scenery is very fine and the wealth of wild flowers and abundance of big game add to the attractiveness of the region.

Study Losses in Kiln-drying Lumber

Losses in kiln-drying lumber have been under intensive study by the Forest Products Laboratories of the Department of the Interior, Canada, for some time. As a result of these investigations, the laboratories have been able to suggest improvements in kiln operation which have already resulted in a marked reduction in the average loss from faulty drying.

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THE GOVERNMENT OF CANADA AND THE CONDUCT OF NATIONAL BUSINESS

Interesting and Informative Radio Address by the Prime Minister of Canada, Rt. Hon. W. L. Mackenzie King
on Affairs of Government



RT. HON. W. L. MACKENZIE KING,
Prime Minister.

THE PRIME MINISTER'S ADDRESS

"LADIES AND GENTLEMEN: I have been asked to say a word to you to-night concerning the purpose and scope of a series of brief addresses to be made, during the course of the present year, on the last Thursday of each month, over the broadcasting network of the Canadian National Railways. The general subject is 'The Nation's Business'. The addresses, which will be delivered by Ministers of the Crown and the Leader of the Opposition in the House of Commons, will seek to familiarize the people of Canada with the manner in which the nation's affairs are administered, and, as far as may be possible in so brief a survey, with their variety and extent. It is intended that the addresses shall be educational in character and that they shall be non-political and non-controversial.

"Every citizen of Canada is interested in the country's business. To-day as never before, the problems of government need the devoted study of all citizens. The tasks which have been placed upon the modern state, and which it is the common duty of the elector and of the Government to solve, are of ever-increasing magnitude and complexity. The range of duties of government everywhere has tremendously increased during the past century, but nowhere more than in Canada. At the same time

Foreword by the Minister of the Interior

The task of the statesman is manifold; he must ever strive to develop his country's resources, to build up her industry and commerce, and to protect her from outside aggression; but above all he must nourish and keep alive the national spirit, without which neither individual nor nation can really live. Canada's elder statesmen—the Fathers of Confederation—bent their backs to the Herculean task of binding together the scattered colonies of British North America, and their successors have laboured to advance that work and to bring about not only union, but a unified nation within the Empire. The Prime Minister of Canada, Right Honourable W. L. Mackenzie King, has held ever before him the duty and privilege of assisting in the development of the nation's higher self. This conception of his responsibility inspired him to set in motion the arrangements which culminated in the Celebration of the Diamond Jubilee of Confederation in 1927, than which no event has contributed more, except the crisis of the war, to the growth of Canada's national consciousness.

Of the features that aided in the success of that Celebration, the newest and most striking, and the one which gave it the personal touch so necessary, was the broadcasting of inspiring messages by those leading in the conduct of the affairs of the nation. The messages rang from coast to coast, and, travelling in the performance of my official duties through the length and breadth of our land, I am constantly reminded of the increased interest in Canadian citizenship which received encouragement from the messages sent out at that time. This moved me to mention to the Prime Minister that I believed our citizens would be interested in learning more of the way in which the nation's business is transacted. At his suggestion I approached Sir Henry Thornton, President of the Canadian National Railways, who extended immediate co-operation with his accustomed vigour and effectiveness. A place was reserved for the addresses on the national hook-up of radio stations and it has been arranged that those taking leading parts in our national affairs will tell how they are conducted. The first address has already been broadcast by the Prime Minister. The Hon. R. B. Bennett, K.C., M.P., Leader of the Opposition, will speak on Thursday evening, the 30th of May.

On the occasion of the inauguration of the plan, Mr. W. D. Robb, Vice-President of the Canadian National Railways, came to Ottawa from Montreal on the evening of April 25 and introduced the Prime Minister to the thousands of people listening-in all over the country and beyond. Right Honourable Mr. King then took his place at the microphone and delivered the address printed below. Thousands heard it; newspapers printed synopses or extracts, but so many desired to have the address in full in permanent form that I have decided to issue it as a supplement to the monthly bulletin of the Department.

Chas Stewart

the interests and activities of the private citizen have expanded. His business concerns are more varied. The demands upon his time by countless religious, social, and professional activities have multiplied. The needs of recreation are more imperative. The result of all this is that the average citizen has frequently less time and interest to give to his public duties at the very moment at which they are making more demands upon him. It is essential that advantage should be taken of every opportunity of bringing the citizens of Canada into closer touch with those who are administering their affairs. It is eminently appropriate, therefore, that radio broadcasting, this new instrument which has been perfected by science, should be used to assist those who are directly or indirectly responsible for the administration of the nation's affairs, in placing before the people, whose trustees they are, as much as may be possible in the way of accurate and detailed information. In the inauguration of this new

contact between those responsible for the work of administration, and those to whom they are responsible, we are, I believe, witnessing to-night a further step along the path which leads to more perfect co-ordination between the will of the people and the fullest expression of that will in the administration of the country's affairs.

"At all events, it is with this objective in mind that members of the Government, and the Leader of the Opposition, who is also a public servant, have undertaken to avail themselves of the opportunity to speak to you over the radio of the work which is being done in your name at Ottawa.

"In a consideration of the nation's business, it is necessary to keep in mind the many subdivisions of our political activities. Our obligations as citizens are not to one but to many communities. Your affairs are administered, not by one, but by many governments. Each is a citizen of his own local municipality, a citizen of his province, a citizen of

the Dominion, a citizen in the community of British nations which comprise the British Empire, a citizen in the world. A political division of labour has developed in the modern world corresponding to the economic division of labour. A high degree of specialization has come about, each Government undertaking its special share of the increased burden, each endeavouring to co-ordinate its task with that of the others. In dealing with the nation's business, it is to the work of the federal Government only, that the present series of addresses will relate. Keep in mind, however, that there remains as a part of the whole, the work which is carried on by the Governments of the several provinces and by urban and rural municipalities.

THE ORGANIZATION OF GOVERNMENT

"Some sixty years ago our forefathers took the sparsely-populated and scattered British colonies which occupied a corner of this continent, and welded them into a Confederation which has grown in the intervening period into a nation stretching from sea to sea. For many years the chief task which faced those who were in charge of the nation's business at Ottawa—a task which still remains, but which is now assured of success through the faith and patriotism of those who have gone before—was the problem of enabling isolated communities to work and trade and think as one; the problem of preserving the essential and life-giving freedom and diversity of the parts, and at the same time developing the unity and the common loyalties of the larger whole. Next, there emerged the task of finding our place in the family of British nations, of working out an enduring basis of union among the far-flung realms that owe allegiance to our common King. This task is well on the way to being solved, and solved again by the recognition of the necessity of seeking unity through liberty, of basing co-operation on diversity. Still more recently we have come to realize that we must play our part in the wider task of seeking a world order; the task of bringing the rule of law and the rule of reason into the relations between nations, a task in which the League of Nations is the most helpful and most consistently active factor.

"The national government which touches all these fields works through three main agencies. There is Parliament, which makes the laws; the Executive, which applies the laws; and the Judiciary, which interprets the laws. It is of the tasks of the Dominion Executive that I wish to speak more particularly to-night.

"Our constitution is based on that of Great Britain. The formal outline of our governmental organization is, I think, known to you all: The Governor General, who represents the King; the Senate, which occupies a position comparable to that of the House of Lords; the House of Commons, elected by the people and controlling the Executive by the method of Cabinet responsibility. What is not so well known, however, is the close relation of the executive and legislative branches of government, and the extent and ramifications of the work undertaken by the Government of the Dominion. When the Fathers of Confederation were dividing their respective duties between the Dominion and Provincial Governments they conferred upon the Dominion, as was natural, the more extensive responsibility. The principles of the British Constitution were so adapted to the needs of Canada that it has since been possible for the central Government to administer an immense territory for the mutual benefit of groups of Canadians who live under greatly varying conditions of employment and environment.

"As in the Motherland, the Executive consists of: first, a political division concerned, in part, with the formulating of policies, the Government or Cabinet of the day, which is practically a committee of Parliament and holds office only so long as it retains the confidence of Parliament; and, second, a non-political division, the permanent Civil Service, whose duty it is to apply the laws and policies in detail.

"The Cabinet might be described as an executive committee of the nation, or the nation's board of directors. It meets at frequent intervals, sometimes daily, to deal with questions which are of more than departmental importance. Its members are chosen from the political party commanding a majority in the House of Commons. They are responsible to Parliament and through Parliament to the people for the administration of the nation's affairs. They have legislative as well as executive duties and responsibilities.

"Under the United States system of government the two bodies, the Legislative and the Executive, are wholly separate and distinct. Members of the Cabinet of the United States give all their time to the work of administration; they are not members of Congress, which makes the laws; they simply administer the laws which Congress enacts. We believe our system to be a better system in that it serves to keep the executive and legislative functions more wholly in accord. It has the effect, however, of vastly increasing the burden of duties and responsibilities of those who, as members of the

Executive, have not only to do with administering policies, but have also the duties of legislators, and responsibility for the policies themselves.

CABINET RESPONSIBILITY

"An important feature of the British system of government is the collective responsibility of the Cabinet. While each Minister is primarily responsible for the administration of his own particular department, that responsibility is shared by all his colleagues. This is the reason why all matters involving a question of government policy are first considered by the Cabinet as a whole, and why Ministers are expected to keep their colleagues fully informed of any departmental matters which are likely to have public significance. When Parliament is in session the Cabinet holds a meeting, of from one to two hours' duration, practically every day between the hour of noon and the time at which Parliament assembles at three o'clock. It also meets to discuss matters of general policy on Saturdays, in either the forenoon or afternoon, and not infrequently at both times. Between sessions of Parliament the meetings of the Cabinet are held at less frequent intervals but are of longer duration. The policies of the Government are shaped as a result of these deliberations, and its legislation drafted in accordance with the lines of policy laid down.

"The proceedings of the Cabinet are presided over by the President of the Privy Council, who, except during part of the period of war and demobilization, has been the Prime Minister. As President of the Council he arranges the agenda and signs the Minutes of Council and its Orders and Recommendations. With the exception of these documents, no record is kept of the proceedings. In the Canadian Cabinet Council Chamber, the Ministers are seated at a round table, they meet as equals, there is no precedence. The proceedings of Council are secret proceedings, and while the Cabinet is in session, no one is admitted to the Council Chamber, unless it be the Clerk of Council or a messenger. No record is kept of the proceedings themselves other than the records to which I have already referred. From the Cabinet the signed orders go to His Excellency the Governor General for his approval. While all executive acts are in the name of the Crown, it is in this manner and by personal conference between the Sovereign or his representative, and the Prime Minister, that the Crown acts only upon the advice of its responsible Ministers. If the advice on which the Sovereign or his representative acts is not in accordance with the will of Parliament, the Ministry is responsible, and being responsible to Parliament and through Parliament to the people, can be held accountable for the advice given.

"In addition to the shaping of government policies and the framing of government measures, Ministers have the responsibility of seeing that the entire business of the country is administered in accordance with the laws which Parliament enacts. This business falls naturally into important divisions and subdivisions to which the main departments of government correspond and it is over these departments that the Ministers of the Crown preside.

WORK OF DEPARTMENTS DESCRIBED

"It is a fundamental task of government to seek to encourage the basic industries of the country. In this connection, we have a Department of Agriculture, a Department of Mines, a Department of Fisheries, each seeking to bring the resources of scientific research and of effective organization to the assistance of those engaged in these all-important fields. Manufacturing is aided by the development of research, and foreign commerce. Canada has the largest foreign trade per head of any country in the world. This trade is encouraged by the Department of Trade and Commerce, through a Commercial Intelligence Service, through the making of commercial treaties, and through the development of steamship connections. In a country of magnificent distances, transportation is of first importance. Railway and waterway questions have therefore always been among the most vital before the country. The Department of Railways and Canals and the Department of Marine seek to develop and regulate the railway facilities, the harbour facilities, the aids to navigation which the commerce of the country demands. The Postal Service of Canada, which employs one out of every four members of the government service, is the largest business undertaking administered by the Government, and one of the largest public services in the country. The Department of Public Works undertakes the construction and maintenance of our public buildings, post offices, customs houses, wharves, and other public works. The Minister of Finance is charged with the duty of keeping the public accounts, of proposing sources of revenue, of controlling taxation, and of administering the public debt. Of these, he gives account in the Budget he presents annually to Parliament. The Minister of National Revenue is responsible for the collection of the revenue raised by customs duty, by excise, by income tax, sales tax, and from other

sources. The Department of the Interior has in its charge the vast territories of the northwest, including the Arctic islands to the Pole; the Department of National Defence controls the military, naval, and air forces. The Department of Justice and the Office of the Solicitor General guard against crime and disorder. The Department of State is the agency through which the Government deals with the provinces and with such questions as those of naturalization and reparations. The activities of other departments will be apparent from their names; as, for example, the Department of Pensions and National Health, concerned more particularly with the well-being of the war veterans; the Department of Immigration and Colonization; the Department of Labour; the Department of Indian Affairs; the Department of Public Printing and Stationery; the Royal Canadian Mounted Police; the Government Archives. Mention might be made of a score or more of other specialized activities. In the addresses of the present series you will be given a concrete presentation of the duties of the various branches of the government service and the problems they face.

EXTERNAL AFFAIRS

"The review of governmental activities I have thus far described relates almost wholly to the internal economy of the nation. The most extensive recent development has been the growth of our relations outside the country—our relations with other parts of the Empire, our relations with foreign countries. We are daily being brought into closer contact with people of every continent and every sea. Gradually the machinery for dealing with those relationships has been evolved. It now centres in a Department of External Affairs. Over this Department I have the honour to preside. For some years past the office of Secretary of State for External Affairs has been held in conjunction with the office of Prime Minister. The Department of External Affairs has to do with the administration of inter-imperial and international policies. It has the supervision of and responsibility for the Office of the High Commissioner for Canada in London, the Canadian legations established at Washington and Paris, and the legation about to be established at Tokyo, and is the department of government with which the Ministers of foreign countries resident in Canada and the British High Commissioner resident at Ottawa have their immediate contacts. Matters pertaining to the participation of Canada in international conferences, imperial conferences, and the League of Nations assemblies and councils are also a part of the machinery for dealing with inter-imperial and international relations, the administrative side of which comes more particularly under the Secretary of State for External Affairs.

THE CIVIL SERVICE OF CANADA

"I may be expected to say what, as a part of this vast organization of the work of government, are the duties and responsibilities of a Prime Minister. When it is recalled that, in addition to acting as President of the Privy Council and Secretary of State for External Affairs, the Prime Minister is the leader of the Government in Parliament, and of his party in the country, to say nothing of the variety of his other obligations, this may, perhaps, best be left to the imagination. Enough, at least, has been said to make it apparent that in the discharge of his many duties a Prime Minister is dependent to an infinite degree upon the loyalty and efficiency of those by whom he is surrounded as colleagues in the Cabinet, and as officials and secretaries, and those who accord him their support in Parliament, and that in the carrying on of the nation's business they, as well as he, are wholly dependent upon that vast body of men and women who comprise what is described collectively as the public service of Canada. On the general efficiency and the sense of public duty of this Service, more than on all else, depends the successful conduct of the nation's business.

"As one who, some thirty years ago, began his association with the administration of our country's affairs as a member of the Civil Service of Canada, and who ever since has had increasing opportunities to gain first-hand knowledge of the work of its membership, I think I may lay claim to speaking with authority when I say that the Civil Service of our Dominion will bear comparison with similar services of any country in the world, alike in its standards of useful public service and in its fidelity to high ideals of public duty.

"LADIES AND GENTLEMEN: I have concluded what I wish to say to you to-night. I thank you cordially for the attention you have been so kind as to give to my remarks. I hope they may serve to stimulate your interest in the other addresses which are to follow, and to cause you, as citizens of Canada, to feel that the nation's business is a common obligation, and that as citizens we have no greater duty, as we can have no higher privilege or opportunity than that of working together in furtherance of the common good."

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TO INVESTIGATE COPPERMINE RIVER MINERAL RESERVE

EXAMINATION OF COPPER DEPOSITS THIS SUMMER

Department of the Interior Sends Explorer
at Present in North to Examine
Closed Area

During the coming summer an investigation of the mineral and other natural resources of the Coppermine River mineral reserve on the Canadian Arctic coast will be undertaken by Major L. T. Burwash, exploratory engineer of the North West Territories and Yukon Branch of the Department of the Interior. The area contained in the reserve is described as being that portion of the Northwest Territories lying north of the 65th parallel of North latitude, and between the 105th and 116th degrees of West longitude, comprising the islands in and the territory adjacent to Coronation gulf and to Bathurst inlet.

For many years the existence of deposits of native copper along the Arctic coast of Canada has been known. The names Coppermine river and Yellowknife Indians (the latter so named because they made knives and utensils from the metal) bear testimony to the early knowledge of these deposits. Thirty years ago the idea prevailed in many quarters that large deposits of almost pure copper were to be found in the area and that its recovery was impracticable only because of the inaccessibility of the territory. Later, during the war, the high price of copper set men thinking of these reported rich deposits and interest in them revived. In the meantime the Dominion Government had the area examined and has, through the Geological Survey of the Department of Mines been informed that while pieces of drift copper are occasionally found and while it seems highly probable that parts of the district contain workable or even rich deposits, the area as a whole is one which to be profitably worked must be developed on a large scale.

Since operation on an extended scale was precluded by the lack of transportation facilities, the Department of the Interior deemed it unwise to have possible future development held up or frustrated by claims staked as ventures, and, therefore, in December, 1918, by Order in Council, withdrew the area in question from disposal under the Mining Regulations. The information received since then has confirmed these reports and the area is still withdrawn.

Major Burwash, who completed his investigations as to the condition of the

(Continued on page 2)

MOUNTAINEERING IN THE SELKIRKS

Famous Rogers Pass Again the Rendezvous—Great Increase in Numbers of Mountain Climbers

The Alpine Club of Canada has chosen Rogers pass in Glacier national park, British Columbia, as the site for its annual camp for the summer of 1929. The region is a memorable one in the annals of Canadian mountaineering for it was here, in 1883, that the first alpine club was organized, with Sir Sandford Fleming as President, the late Dr. G. M.

fields, made numerous ascents in the region and expressed their surprise at the lack of interest shown by Canadians themselves in this delightful field for exploration and adventure. However, if the enthusiasm of Canadians was slow in awakening, this neglect has been more than atoned for by subsequent events. Twenty-three years ago, in 1906, the



Mountaineering in the Selkirks—Mount Sir Donald just west of Rogers pass in Glacier national park, British Columbia, is one of the most climbed peaks in the Selkirks. In the foreground of this view are the flower-covered slopes of the Upper Cougar valley, a typical high valley near timber line, well known as the site of the remarkable Nakimu Caves.

Grant, Principal of Queen's University, Secretary, and Mr. S. Hall Fleming, Treasurer. A graphic account of the incident is found in Sir Sandford Fleming's book, "England and Canada," published in 1884. The party had just reached the summit of the pass. Around, in full view, were a score of peaks, offering all that challenges the alpine climber—grassy alpine slopes rising to black precipices, icy glaciers and snow-fields leading up to pure white summits. Here was a new and superb mountain playground. A vision of future possibilities touched the imaginations of the members of the party, and, seated on a grassy knoll, a draft constitution was adopted and officers elected for the first mountaineering club of Canada.

The organization so enthusiastically begun, however, was not destined to take actual shape for several years. In the meantime the growing fame of the Selkirk mountains had attracted several prominent members of the English and Swiss Alpine Clubs and, a little later, of the Appalachian Club of the United States. These men, many of them distinguished climbers in other

scheme was revived and the "Alpine Club of Canada" definitely organized. Its success was immediate. Beginning with a membership of nearly four score it has continued to grow steadily and now numbers approximately 1,000 members. During this period it has greatly stimulated the interest of Canadians in the noble sport of mountaineering, has contributed valuable services to the knowledge and opening up of the mountains and, through its popular annual camps, has made it possible for hundreds to participate at slight expense in this healthful recreation. It was natural that the Selkirk mountains, outstanding as they are in opportunities for climbing, should be one of the first regions to attract the club and that the third annual camp should be held in Glacier national park, at the summit of Rogers pass. Now, twenty-one years later, the Club will again revisit this historic spot.

The name "Rogers pass" must always stand out boldly in the record of the opening up of the Canadian West. It was the discovery of this crossing which

(Continued on page 2)

BRAVE RESCUE IN YUKON MINE IS RECOGNIZED

HUMANE ASSOCIATION AWARDS MEDAL

His Excellency the Governor General and
the Minister of the Interior Add
Their Praises

The ancients venerated their heroes and it is well that we should follow their example and honour ours. History extols the bravery of a king of old who descended into a pit and slew a lion in a time of snow, and when John McHugh, a sturdy miner of Keno, Yukon Territory, went down into a mine shaft and rescued a companion from a more dangerous place than even a den of lions it was eminently fitting that the Royal Canadian Humane Association should award him its medal for bravery. His Excellency Lord Willingdon, Governor General, and Hon. Charles Stewart, Minister of the Interior, added their congratulations with warm words of praise. While the Yukon is much changed from the gold-rush days of the early years of the century and it is no longer the land of the picturesque placer miner of whom poets and novelists have written, yet adventure and romance, fortitude and bravery did not take their flight with the advent of the present era of electric dredges and hardrock mining methods, as is shown by the event here described.

On the 20th of March, 1926, Sinclair Dunnett and John McHugh were working at the bottom of a 35-foot shaft on the Dixie claim in the Mayo district. They ignited seven fuses to blast the rock at the foot of the shaft and started up the ladder to escape from danger. Dunnett was leading and had just reached the top when he missed his hold and plunged downward head foremost. McHugh, who was half way up, braced himself on the ladder and with his shoulder managed to break Dunnett's fall, causing him to turn over in the air so that he alighted feet foremost instead of on his head. That was presence of mind. Straight up was daylight and safety; straight down was darkness and imminent death. At any moment the blasts might explode. But—fully aware of what he did—without an instant's hesitation, McHugh slid down the ladder, pulled Dunnett, now unconscious, out from the midst of the hissing fuses, got him on his back and started up again. It was a Herculean task for McHugh to climb bearing his unconscious mate and one which might never have been accomplished in time had not John Abraham, the third partner in the mine, slid down the ladder

(Continued on page 3)

HUDSON BAY RAILWAY REACHES CHURCHILL

By Laying Rails on Frozen Ground Trains
Entered Townsite, March 29

Hudson bay is now on the railway map of the Dominion. By linking this historic body of water with the outer world by steel, yet another epic has been added to the glorious saga of Canadian achievement, and the speedy laying of the track constitutes in truth the accomplishment of what many people deemed to be impossible. Certainly there is no other main line exactly like the Hudson Bay railway which stretches northeastward across Manitoba from The Pas to Churchill, on Hudson bay, and no other railway has been built under similar weather conditions.

Neither frost nor snow, blizzard nor muskeg has stopped the progress of this dual feat of engineering construction and transportation. The last link of the temporary track has been laid, the stores and necessities for the development of the seaport and railway terminus have been successfully unloaded at Churchill, and the building of the port is proceeding apace. It matters not that the breakup of the frost will suspend traffic over the temporary track until such time as the grading gangs can complete the ballasting of it, for the weather will not now interfere with the activities at Churchill.

The undertaking was, on the one hand, a never-ceasing fight against the elements and the physical obstructions of a treacherous terrain, and, on the other hand, a grim race against time, calling for bold and urgent expedients on the part of railway engineers. If the last rail had not been laid before the frost broke, the consequent delay would have been very serious. Steel reached Churchill on March 29, following which more than 300 carloads of material for the development of the port and the railway terminus were taken in, so that no time need be lost by interruption due to spring break-up.

Apart altogether from the personal hardships of the workers, the undertaking was full of seemingly insuperable difficulties. Much of the land was muskeg, and it was here that the talent of the Canadian engineer came in; for he utilized the aid of the frost in carrying his work forward without delay over time-consuming obstructions. When cold weather came, grading work was abandoned until the spring and the tracks were laid on ties on the frozen ground, as in the building of the Flinflon railway. With the advent of spring, the grading gangs took up their interrupted work of ballasting the temporary track, one gang working up from the south, while at the same time another party began working its way towards them from Churchill. Somewhere along the track the parties will meet, most likely early next August, and the golden spike will be driven by Right Honourable George P. Graham, who as Minister of Railways and Canals turned at The Pas, Manitoba, the first sod in the construction of the railway. Thus the finishing touch will be put on an undertaking in railway engineering that has won the admiration of the world. Owing to the large amount of work to be done on the port facilities, engineers expect that the first shipments of grain will not be made until the season of 1930.

The work at Churchill will proceed on carefully planned lines so that there will be no demand for labour which has not been foreseen and provided for. The

MOUNTAINEERING IN THE SELKIRKS

(Continued from page 1)

provided the last key to the fortress of the Rockies, and made possible the construction of the Canadian Pacific railway by its present route. When in 1880 the famous "Syndicate" was formed to undertake the construction of the line, Major A. B. Rogers was appointed engineer in charge of the mountain division. On the west Mr. Walter Moberly had already established the feasibility of the Eagle pass through the Gold range; on the east the Kicking-horse pass, discovered nearly a quarter of a century before by Sir James Hector, provided the key to the main Rockies. Between the two lay the unknown world of the Selkirks. Moberly had suggested following the Big Bend of the Columbia and so circumventing the difficulty, but Major Rogers determined, if humanly possible, to force a passage through and after incredible hardships and difficulties discovered the pass which bears his name.

Each year brings an increasing stream of visitors to enjoy the wonders of these beautiful ranges. Less imposing in height than the main Rockies, the Selkirks, on account of the beauty of their colouring, the luxuriance of their forest and plant life, their bewildering array of glaciers and snowfields, will always seem to many the climax of Canadian mountain scenery. Lying within the oval made by the Columbia and the Kootenay rivers, they form a sort of "island of mountains," 300 miles long, representing a geological history aeons older than that of the main Rockies; for when the eastern ranges were still submerged beneath an inland sea, the Selkirks were already old "rearing their serrated and snow-capped summits above the pre-historic ocean". Here is found the peculiar phenomenon which occurs in the Harz mountains, known as the "Spectre of the Broken". The requisite conditions are said to be a "near-by bank of cloud with the sun in nearly the same horizontal plane as the spectator. The

shadow of the spectator is thus thrown upon the cloud-bank, its size depending upon the distance the cloud is away". A prismatic circle surrounds the shadow which may take the form of an enormous giant or an amusing manikin, depending upon conditions. Among the interesting botanical curiosities is the so-called "red snow" (*Protococcus nivalis*), a minute plant, one of the algae, which sometimes covers a whole snowbank, giving it a peculiar reddish hue.

Though other regions may boast loftier summits and more resounding names, the Selkirks keep for many nature lovers, a charm uniquely their own, undiminished by time, and unsurpassed by any other part of the Canadian Alps.

TO INVESTIGATE COPPERMINE RIVER MINERAL RESERVE

(Continued from page 1)

natives, the abundance of wild life and related matters in and around Boothia peninsula early this year, has been in the Far North since the summer of 1928. In June of that year he left Ottawa for Aklavik at the mouth of the Mackenzie river. From that post he travelled eastward in the Department's auxiliary power schooner, *Ptarmigan*, along the Arctic coast, visiting native settlements and trading posts en route. Early in September he left Victoria island for the southeast coast of King William island where he established his winter quarters in Gjoa harbour. Later he proceeded by dog team to Kent bay near the magnetic pole where the Hudson Bay Company's steamer, *Fort James*, was stationed for the winter and through its wireless set, Major Burwash was able to keep in touch with Ottawa. He had completed his investigations in Boothia peninsula and around King William island when he received wireless instructions from the Department to proceed as soon as possible to the Coppermine and make a series of investigations in that area.

About the middle of April he left his winter quarters and started his journey south and west across the ice to the Coppermine. Major Burwash expects to reach that area early in June. He will spend the summer in and around the reserve and will come out to Norman via Great Bear lake in time to catch the last boat up the Mackenzie river system to railhead at McMurray.

Important Fossil Beds

The Red Deer valley of Alberta is exceedingly rich in fossil remains of dinosaurs and other extinct vertebrate animals, which are being slowly exhumed by erosion of the sides of the valley. It is the most productive collecting field in Canada and has already yielded much new and well preserved material to the museums at Ottawa, Toronto, Edmonton, and New York.

Waterton Lakes Famous for Trout

Excellent fishing may be enjoyed in the National Parks of Canada, especially in the Waterton Lakes park, Alberta, which is famous for its trout. Specimens of trout weighing as much as fifty pounds have been taken from Waterton lakes.

Strength of Fire-killed Timber

Recent tests at the Department of the Interior's Forest Products Laboratories, Vancouver branch, show that fire-killed western cedar poles have practically the same strength as those obtained from green trees, provided there are no other defects.

HOW THE UNIVERSE REVOLVES IN SPACE

Dominion Astrophysical Observatory's
Investigations Confirm Theories About
Celestial Motion

For thousands of years, ever since man began to observe his surroundings in space, the idea of revolution, or circular movement, has been the keynote of his speculations. The early belief that the sun, moon, planets, and stars revolved around the earth persisted until the sixteenth century, when the theory was evolved that the sun and not the earth was the centre of motion. It has to be remembered, of course, that the properties and distances of the stars were unknown until the nineteenth century. Various hypotheses have been made as to the laws governing the motions of the different parts of our stellar system, otherwise known to astronomers as the "Galaxy"—the aggregation of thousands of millions of stars in the shape of a very much flattened watch—though some of these hypotheses such as the suggestion that the entire Galaxy was in rotation around the star Alcyone, the brightest of the Pleiades, excited considerable interest, none of them received the general endorsement of astronomers.

There the matter remained until two years ago when came the proposition of Lindblad, the Swedish astronomer, that the Galaxy, revolved in its own plane around a very distant centre, a theory which succeeded in accounting for some hitherto unexplained motions of the stars. The next step in this wonderful conception was made by the Dutch astronomer, Oort, who analysed the motions of the nearer stars and was able to show that they moved as if the Galaxy circled around a very distant point in the direction of the constellation Sagittarius. Oort, however, had only meagre information on the motions of the more distant stars, which are much more useful than the nearer stars in proving the presence of this movement, and to Canada came the distinction of putting the theory on a firmer basis.

Through an accurate mathematical analysis of the motions of the more distant stars made at Victoria, British Columbia, by the Dominion Astrophysical Observatory, Department of the Interior, there is no doubt that these stars are most distinctly and definitely moving almost exactly as they would if the entire stellar system (the Galaxy) were in rotation around a very distant centre. Further the direction of this centre, determined from these motions, agrees within a degree with the direction derived by an altogether different method, that is, from the distribution of star clusters. Among the results obtained at the Victoria Observatory on the motions, distances, and physical properties of the hottest, brightest, and most massive stars in the sky, are the hitherto unpublished velocities of some 500 stars more distant than any available to Oort, and hence of especial value in testing and confirming the rotation.

The contemplation of the sublimity and majesty of this incomprehensibly huge galactic system is staggering. One hundred million years is required for the stars of this wheeling mass to complete a single revolution. Light travels at the rate of 186,000 miles a second, yet, even at this inconceivable rate, two hundred thousand years would be con-

(Continued on page 3)

Department of the Interior transferred the land on which the development is to take place to the Department of Railways and Canals. The latter, after reserving the lands required for the terminals, wharves, and other port facilities, turned over, by Order in Council, the remainder of the area to the Manitoba Provincial Government which will administer the site through its Townsites Branch. The planning of the town, the organization of the municipality, and the decision as to whether lots will be sold or leased all rest with the provincial authorities and it is stated every precaution is being taken to prevent anything in the nature of a real estate boom.

OIL PRODUCTION IN ALBERTA DURING FEBRUARY, 1929

[Output] was Higher Than During the Same
Period last Year

Comparative figures compiled in the Department of the Interior from reports made by producers show that during the month of February, 1929, production of petroleum in the oil-fields of Alberta was higher than in the same period last year. The table follows:

	Naphtha 60° or higher	Light Crude 30°-60°	Heavy Crude 30° or lower	Total
	(brls.)	(brls.)	(brls.)	(brls.)
February, 1929..	36,174	7,567	491	44,232
February, 1928..	26,180	5,441	611	32,232

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OTTAWA, MAY, 1929

BRAVE RESCUE IN YUKON MINE IS RECOGNIZED

(Continued from page 1)

to meet McHugh and help him up. With their united exertions they got Dunnett about half way up the ladder when the blast exploded, throwing rocks all around them, but fortunately none of them were injured.

It was considered that McHugh had twice saved the life of his friend, first by breaking his fall and then by getting him out of the reach of the dynamite blasts. The Royal Canadian Humane Association was apprised of the circumstances and awarded McHugh the society's medal for this brave act. The Association asked Hon. Charles Stewart, Minister of the Interior, to see that the medal was duly presented, he being considered the person in central Canada most closely in touch, both officially and personally, with affairs in Yukon Territory.

Knowing the keen interest which His Excellency the Governor General takes in examples of outstanding merit, and realizing how a word from him would be prized by the recipient and his friends, and generally throughout Yukon Territory, Hon. Mr. Stewart brought the matter to the attention of Lord Willingdon. His Excellency with characteristic appreciation and promptness at once penned the following message which he entrusted to Hon. Mr. Stewart.

"Would you please express to Mr. John McHugh my keen satisfaction at the fact that the Royal Canadian Humane Association has thought well to present him with the Bronze Medal in recognition of a very gallant action.

"I congratulate him very warmly and much wish I could be present on the occasion of the presentation to personally thank him for his act of bravery in rescuing a fellow worker from a position of the gravest danger."

To have the presentation made in a fitting manner Hon. Mr. Stewart forwarded the medal to Mr. George I. MacLean, Gold Commissioner of the Yukon, at Dawson, with a letter containing His Excellency's message and closing with these words:—

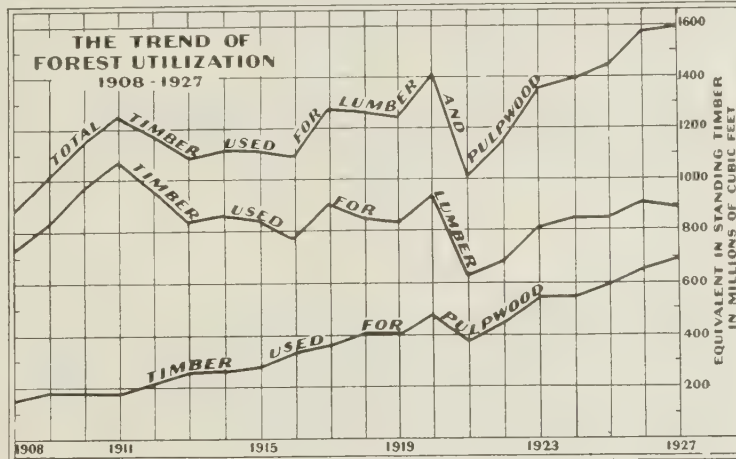
"I wish you would convey to Mr. McHugh my personal congratulations. It is a matter of very great satisfaction that his devotion to a fellow miner has been recognized by the Royal Cana-

TIMBER CONSUMPTION FOR LUMBER AND PULPWOOD COMPARED

Figures compiled by the Forest Service of the Department of the Interior afford a striking evidence of the manner in which Canada's forests have in late years been subjected to a heavily increasing demand for raw materials.

The timber consumption in the manufacture of lumber has shown no very pronounced upward trend

to a point where it is equal to about 77 per cent of that used for lumber and the trend, except for a slight reaction in 1920-21, has been generally upward. It is quite conceivable that a few more years may see the pulpwood industry outweighing the lumber industry in its yearly tax upon the Dominion's forest supplies.



in the last decade or so, but the advance of the pulpwood industry has been responsible for changing the whole aspect of forest utilization. Twenty years or so ago the yearly pulpwood cut, expressed in terms of standing timber, was equivalent to hardly 20 per cent of the annual lumber cut. To-day the timber consumption for pulpwood has risen

The main significance of this trend lies in the fact that with these two timber-using industries both developed upon a huge scale, the Dominion now has a vastly increased stake in good forest management. Forest conservation to-day should have behind it an infinitely stronger commercial incentive and support than ever before.

dian Humane Association. Such deeds of heroism deserve the highest commendation and I trust this brave act will be an inspiration to others to emulate his example."

Mr. MacLean sought for a suitable opportunity to make the presentation and found it when Mr. Livingston Wernecke, Manager of the Treadwell Yukon Company, invited him to attend a concert in the company's hall at Keno. Here is where the up-to-dateness of the new North enters. The message came by wireless from Mr. Wernecke at Mayo, about 150 miles from Dawson, Mr. MacLean accepted and arranged for the attendance of Mr. McHugh, it being agreed that the latter should not be told the reason, as otherwise his modesty would cause him to absent himself. Then in his letter to the Minister of the Interior Mr. MacLean adds quite as a matter of course: "Mr. Wernecke sent his plane for me, and, leaving Dawson at 2 p.m., we reached Mayo at 3.10 p.m." A hundred and fifty miles in an hour and ten minutes is very different from four or five days with horses or dogs. After spending some time at Mayo the party went on by motor car at Keno, where the people of the community both men and women were assembled for the concert. The chairman at the appropriate moment called upon Mr. MacLean for an address and the Gold Commissioner made the presentation. He read the messages from His Excellency and from Hon. Mr. Stewart and, speaking for himself, declared it was indeed an honour to pin this medal on the breast of such a brave man.

In replying Mr. McHugh said he had done only what any other man would do under the circumstances; nevertheless, he did prize the medal and the

messages which accompanied it and would always preserve them among his most cherished possessions.

At the conclusion of the proceedings Mr. McHugh received the personal congratulations of two hundred friends and neighbours gathered for the occasion.

HOW THE UNIVERSE REVOLVES IN SPACE

(Continued from page 2)

summed in crossing the diameter of the Galaxy. In all probability the centre of the Galaxy is some 50,000 light years—the distance light would travel in that time—away from the Earth in the direction of Sagittarius.

Just as the rotation of the solar system can easily be determined from the Earth, so the revolving motion of the Galaxy can, though not so easily, be tested from the movements of the neighbouring stars. There is reason to believe that the Galaxy does not revolve like a wheel, but that the stars nearer the centre move more quickly than those towards the edge, somewhat like the Solar system where the inner planets move with greater rapidity than the outer. Indeed were it not for this peculiarity it would be impossible to recognize the rotation at all.

The confirmation by the Dominion Astrophysical Observatory of the work initiated by Lindblad and Oort is indicative of the position in astronomy held by Canada amongst the nations of the world, and is a tribute to her progressiveness in having the largest and most powerful telescope in the British Empire, and second largest in the world, by means of which the results just recorded have been made possible.

HOME LIFE OF WESTERN INDIANS HAS IMPROVED*

Prosperous Conditions Reflected in Better
Homes and Advanced Mode of
Living

The progress of the Indians on reserves in the three Prairie Provinces towards a position of self-support and independence is one of the gratifying features of the work of the Department of Indian Affairs. In farming and cattle raising these wards of the Government have, during recent years, scored conspicuous successes and the prosperous conditions prevailing on western reserves are reflected in the improved mode of living. New houses are springing up on all the reserves at the annual rate of from 350 to 400. These are of log and frame construction with at least six windows providing ample light and ventilation. Well kept gardens are laid out near many of these homes while milch cows, flocks of poultry, and pigs are not uncommon sights in the barnyards.

The improvement in home life on the reserves is due in a large measure to the training received by the young Indian women in the boarding schools maintained by the Department. In these they learn, among other things the principles of domestic science and hygiene. At one time it was a difficult matter to make the Indians realize the value of milk as a food for themselves and their children and to get them to milk their cows. However, a gradual change has taken place in their attitude. An increasing number of cows are being milked and milk, cream, and butter are in use in Indian homes. The development of gardening is another gratifying feature of the Indians' progress and last year nearly 350 acres were sown to vegetables.

In the matter of hygiene, the Department of Indian Affairs makes every effort to encourage good practice. Where the wives and mothers are school graduates, the value of sanitary conditions is fully realized, and among the older Indian women the work of the travelling nurses and field matrons is gradually bearing fruit. Four travelling nurses are constantly on the road visiting Indian homes on the various reserves in the West, instructing the women how to live and how to care for their children. This service is supplemented by the work of a staff of field matrons who make frequent visits to give any advice and assistance needed by the native women.

The care of the aged is also a particular responsibility of the Department and officers on the reserves provide food, clothing, and homes for indigent members of the bands. During the last three years the policy of the Department has been to encourage as many old Indians as possible to live in teepees during the summer. The teepees are usually large and well ventilated and the old Indians are greatly benefited in health by this practice of living in these airy, summer habitations.

*Prepared at the direction of Dr. Duncan C. Scott, Deputy Superintendent General of Indian Affairs, by Mr. W. M. Graham, Indian Commissioner.

Rocky Mountains Park

Rocky Mountains national park, with headquarters at Banff, Alberta, is the oldest and second largest of our national parks. It has an area of 3,834 square miles and contains some of the finest recreational and scenic regions in the world.

RESTOCKING CANADA'S LAKES AND RIVERS

Important Work of Fish Cultural Service,
Department of Marine and Fisheries

Canada's sea and inland fisheries are among the most extensive and valuable in the world. The natural reproduction of sea fisheries is not, up to the present, showing the need for artificial assistance, probably because the spawning grounds and sea pasturages of the oceans are so extensive that the annual reproduction keeps pace with the toll taken by the commercial fishermen. Natural reproduction has not, however, been found sufficient to maintain the fishing in our lakes and rivers on account of intensive operations, and to counteract this situation the Department of Marine and Fisheries, through its Fish Cultural Service, operates a number of fish hatcheries located at strategic points across Canada from the Atlantic to the Pacific. From these establishments annual distributions of fish eggs, fry, and fingerlings are made with a view to assisting nature in maintaining the productiveness of the inland waters.

During the fiscal year, 1927, the Dominion Fish Cultural Service operated 24 main fish hatcheries, 7 subsidiary hatcheries, and four salmon retaining ponds. These were maintained in all the provinces in which the Dominion Government administers the fisheries, namely, Nova Scotia, New Brunswick, Prince Edward Island, Manitoba, Saskatchewan, Alberta, and British Columbia. Ontario and Quebec administer their fisheries and operate their own fish cultural services. The 1927 distribution from the Federal hatcheries reached a total of 295,283,782 fry, advanced fry, and fingerlings. This distribution included the more valuable food and game fishes, such as Atlantic salmon, rainbow trout, cut-throat trout, steelhead salmon, Kamloops trout, Loch Leven trout, brown trout, sockeye salmon, spring salmon, speckled trout, whitefish, salmon trout, and pickerel. The largest distributions were of whitefish, sockeye salmon, Atlantic salmon, and pickerel in the order named.

In addition to the distributions that were made from the hatcheries, thirty-five lakes and streams received allotments of fry and older fish from other bodies of water. This work was largely confined to the Prairie Provinces, where many districts are not readily accessible to existing hatcheries, and involved the capture and transfer, in many instances for considerable distances, of 35,961 fish, comprising six different species.

The propagation of the commercial food fishes has always been given first attention by the Fish Cultural Service but in recent years the demands for the stocking and restocking of lakes and streams with game fish has been steadily growing so that now the hatching of trout and other game fish forms an important part of the work. At the St. John, New Brunswick, hatchery, where progress is being made in the development of a brood stock of trout, nearly two and three-quarter million trout eggs were produced in 1927. The growing value of a well-stocked angling stream may be gauged by a comparison of the rentals which were obtained in 1922 and 1927 for the angling privileges on certain portions of the Restigouche river and its tributaries. The angling in seventeen stretches of the river which was disposed of by auction at Fredericton, New Brunswick, in 1922 brought annual rentals amounting to \$16,815. In 1927

POWER DEVELOPMENT IN ALBERTA

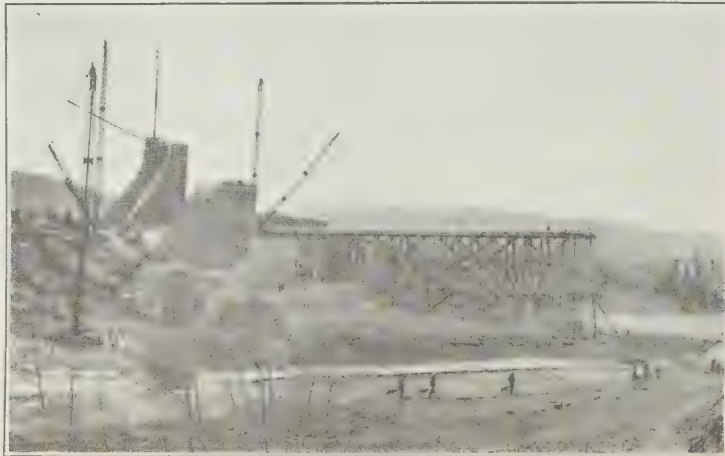
Rapid Progress Made With Construction of Ghost Plant on Bow River

One of the most interesting of the hydro-electric developments at present being constructed in Western Canada under license from the Department of the Interior is that of the Calgary Power Company, Limited, at what is known as the Ghost site on the Bow river about thirty-three miles west of Calgary.

The undertaking involves the construction of works spanning the Bow

and impervious portion of the dam. A certain amount of work has been done on stripping the surface of Ghost hill and the concrete piers of the Ghost traffic bridge have been completed and are ready for the placing of the steel spans.

With the exception of about two weeks of extremely low temperature in the month of February the work was favoured with exceptionally fine weather



Hydro-electric Power Development in Alberta—Rapid progress is being made in the construction of the power plant at the Ghost site on the Bow river. The above view is from a recent progress report of the Department of the Interior's engineer at the site.

River valley immediately below the entrance of the Ghost river, the structures having a total length of almost a mile and providing a head of 105 feet and a pondage of 45,000 acre-feet. The power station, which is designed to contain three 18,000 horse-power units, two of which are being initially installed, is of concrete construction and is integral with a concrete gravity dam founded on rock which will span the existing river channel and adjacent banks. Flanking the concrete dam to the south is an earth (hydraulic) fill dam with a maximum height of about 65 feet which extends about 2,000 feet across bench lands to the higher grounds where the main sluiceway dam will be located to provide for the discharge of surplus waters. To the north the concrete dam connects with Ghost hill, the slopes of which will be first excavated and then covered with an impervious earth blanket. The undertaking also includes the construction of a new traffic bridge across the Ghost river valley and relocation of a portion of the Calgary-Banff highway to connect with the bridge.

The general contract for the work was awarded early in the summer of 1928 and after assembling plant and material at the site, active construction was placed under way about the first of October. Work steadily proceeded during the autumn and winter months and rapid progress has been made. Concrete work on the power station sub-structure and gravity dam is well advanced while the upstream and downstream gravel toes of the south earth (hydraulic) fill dam have been completed and preparations are well advanced for pumping in the hydraulic fill material which will comprise the central

the angling in the same waters brought the record figure of \$75,500 per year for the following five years.

throughout the winter and the construction schedule has been well maintained. The advent of warmer weather enabled the work to proceed with greater expedition and it is expected that the plant will go into initial operation some time in November, 1929.

In accordance with the terms of the Dominion Water Power Regulations, under which this development is being constructed, the Department of the Interior has an inspecting engineer resident at the site whose duties are to see that the works are constructed in strict accordance with the plans as approved and to keep a close check upon the actual cost of the undertaking. Weekly progress reports are submitted by this resident engineer so that the Department is kept closely in touch with all details as the work advances.

The Ghost development when the installation of the initial two units is complete will add 36,000 horse-power to the installed capacity of the Calgary Power Company's system which already includes two other hydro-electric stations on the Bow river, the Horseshoe Falls station with 20,000 horse-power and the Kananaskis station with 11,600 horse-power. The power from these feeds into a transmission network which covers a large part of southern Alberta and serves power to many municipalities including Calgary, Lethbridge, Red Deer, and other centres of lesser population.

Banff an All-Year Round Resort

Banff, Alberta, is a mecca for holiday seekers in both summer and winter. During the summer months visitors may enjoy practically every outdoor recreation. Each winter a carnival is held which is attracting an increasing number of visitors annually, and it is predicted that Banff will soon be a world-famous winter resort.

TO EXTEND MEDICAL SERVICE IN FAR NORTH

Department of the Interior Will Establish
Two More Stations in Arctic Canada

Realizing that the future development of Northern Canada depends to a large extent on the health and general well-being of the native population every effort is being put forth by the Department of the Interior to protect the Eskimos of the Far North. When the Department assumed charge of Eskimo affairs in 1927 one of the important steps taken was the decision to increase the number of medical officers among the natives. Two officers were stationed in the Arctic during 1928, one at Pangnirtung, Baffin island, and the other at Aklavik, Mackenzie River delta. This year a third post will be established at Chesterfield Inlet on the western shore of Hudson bay, and a fourth on the Arctic coast at the mouth of the Coppermine river.

Last year Dr. L. D. Livingstone was sent North with the 1928 Canadian Arctic Expedition to the posts in the eastern islands of the Arctic archipelago and made his headquarters at Pangnirtung on Baffin island. Later Dr. J. A. Urquhart proceeded to the western Arctic and established himself at Aklavik at the mouth of the Mackenzie river. When the 1929 Arctic Expedition leaves North Sydney, Nova Scotia, about July 20 on board the ss. *Beothic*, it will include a new medical officer to relieve Dr. Livingstone at Pangnirtung. The change will be made during the southern leg of the patrol and Dr. Livingstone will accompany the *Beothic* to Chesterfield Inlet where the materials and supplies will be landed for the new medical post. It is expected Dr. Livingstone will continue the trip on the *Beothic* to the home port and will submit his report to the North West Territories and Yukon Branch, at Ottawa. Later, probably in January, 1930, he will set out for Chesterfield Inlet where he will remain as Departmental Medical Officer for a year or more. Plans for the establishment of the medical officer at the mouth of the Coppermine river are being formulated.

The Department of the Interior through its North West Territories and Yukon Branch, in addition is co-operating with the Department of Indian Affairs in maintaining medical officers at different points in the Northwest Territories. These officers, who are given the status of Medical Health Officers, are Dr. W. A. M. Truesdell, Simpson; Dr. C. Bourget, Resolution; and Dr. A. L. McDonald, Fort Smith, all in Mackenzie District.

Parks Attract Foreign Tourists

Under the policy of development and publicity being carried out by the Dominion Government the national parks are not only rendering a wider service each year to Canadians themselves, but they are adding to the knowledge of Canada abroad and attracting to the Dominion thousands of visitors from other countries in every part of the globe.

Dairying an Important Industry

Dairying is one of the oldest and one of the most important of the industries of Canada. It owes its modern development to the introduction of the factory system for the making of cheese and butter, to the invention of the centrifugal cream separator, and to the facilities afforded by improved methods of cold storage.

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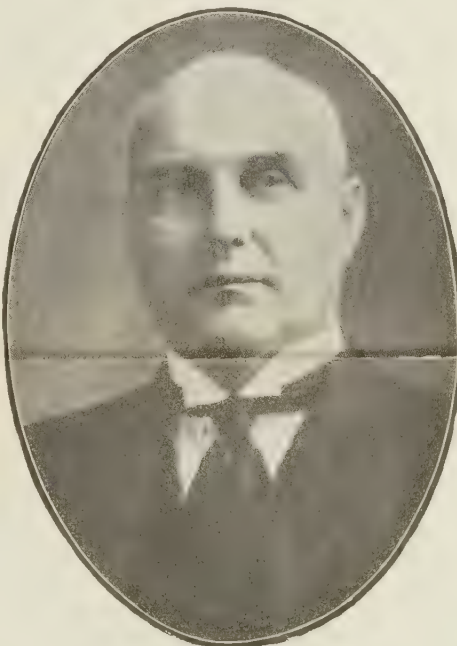
MINISTER OF THE INTERIOR TELLS STORY OF NATION'S BUSINESS

Address of the Minister of the Interior

"LADIES AND GENTLEMEN: In continuing the work, begun a month ago by the Prime Minister, of explaining in radio addresses how the nation's business is done, the privilege that lies before me this evening is that of compressing into fifteen minutes a description of the functions of the Department of the Interior of Canada, over which as Minister I have the honour to preside.

"The work of the Department of the Interior falls into two main divisions: the administration of the natural resources of the western and northern parts of Canada and the directing of scientific and investigative work related to those resources throughout the Dominion. Those parts of Canada, in which the Minister of the Interior is directly responsible for the administration of the resources embrace the three Prairie Provinces of Manitoba, Saskatchewan and Alberta, the Railway Belt and Peace River Block in British Columbia, and the Yukon and Northwest Territories, which latter take in all the region from the sixtieth parallel of latitude to the North Pole. In these areas which cover more than half of Canada are assets of immense value, which though only partially developed have already contributed enormously to the prosperity of the Dominion. Much remains to be revealed in many parts of them which have not yet been explored or mapped; the future therefore holds in its lap that romance which al-

(Address by Radio May 30, 1929)



HONOURABLE CHARLES STEWART,
Minister of the Interior.

ways accompanies pioneer work and is never entirely absent from the onward march of industry. The aim of the Department is to foster this pioneer work as quickly as possible by giving industry every legitimate opportunity and assistance.

"You may perhaps have remarked the northern trend of settlement in the past few years. Eighty per cent of the 2,750,000 acres taken up by settlers in western Canada last year was located in such northerly land districts as Prince Albert, Peace River, and Grande Prairie. The migration northward has been most conspicuous in the Peace River country, where more than 4,500 homesteads were taken up last year. This fertile tract, in which there are still to be had many million acres of good arable land, is but one of several extensive undeveloped areas in northern Alberta and British Columbia, equally fertile and equally capable of adding millions of dollars to the yearly monetary value of our crops, thanks to the new varieties of grain which research has made available for these northerly latitudes. Even in the more settled Prairie Provinces twice as much arable land as is now occupied awaits settlers. You will better comprehend what this means to the future of Canada when I tell you that these provinces are now yielding annually field crops valued at six hundred and fifty million dollars, a sum treble that of fifteen years ago. Saskatchewan alone yielded crops valued at \$334,867,000 in 1928.

THE POSTMASTER GENERAL WILL SPEAK ON THE 27th OF JUNE

When the average Canadian citizen writes a letter, places a postage stamp on the envelope, and drops it into a handily placed mail box, he seldom gives the matter of its transit any more thought, knowing that it will reach its destination with surety and despatch. He does not stop to consider the tremendous amount of planning, of care and of labour required in the administration of a complicated and highly organized public service whose responsibility is to see that the message will reach its destination quite regardless of how distant or out of the way the place may be to which it is addressed. The safe delivery of our postal messages is a public service which we take for granted and which, because it seems so matter-of-course, inspires no thought as to labour involved or means employed, nor recalls to our minds the romance connected with the history of the development of this great service from the olden days of post-chaisses to the present-day speedy methods.

The Canadian Postal Service operates over a territory the third most extensive of those served by any postal system in the world. As one who on various occasions has been Acting Post-

master General, I have had an insight into the operation of this complex and effective system. Service to the public in the carrying and safe delivery of the mail is the objective of Canada's Post Office Department and this it gives, but this service cannot reach its highest efficiency without the full co-operation of the public.

On Thursday evening, June 27, an opportunity will be given us to learn what is being done for our benefit by the Postal Service of Canada. Hon. P. J. Veniot, the Postmaster General, will speak to us over the Canadian National Railways broadcasting system on the activities of the Post Office Department. We shall hear of its romance, of its obligations and of its efficiency, and also what is required of us in that co-operation in which each one may do his part. The story of this Service which so closely and directly touches each of us cannot fail to be of intense interest to all who listen in.

Chas Stewart

"But plow lands and grazing lands with their crops and herds are not the only major resource which the Department of the Interior administers. The unprecedented activity during recent years in mining exploration has extended to distant sections within the vast areas under the jurisdiction of the Department. So noteworthy has been the progress made that water-powers have had to be harnessed, railways built, and the latest methods of transportation, including the aeroplane, introduced to open up what hitherto have been remote and unpenetrated regions. In the Flinflon and Sheritt-Gordon areas bordering upon the Manitoba-Saskatchewan boundary, millions of tons of ore have already been blocked out, a railway now reaches one of the mining camps, and a smelter is under construction.

"The production of coal in Alberta has been steadily increasing and in 1928 amounted to 7,335,489 tons against 6,503,705 tons in 1926. The coal reserves of this province are of great magnitude and assure to western industry cheap power. Fifty thousand acres of these coal lands have been set aside to be held as a reserve for the people of the southern prairie region. In Alberta is found the largest known occurrence of solid asphaltic material, and every possible encouragement is being given by the Department to the development of these bituminous sands. But perhaps at the moment the most outstanding mineral development is the successful drilling for oil and gas in the Turner Valley oil field. Within the past eight years the commercial production of Alberta oil has risen from little or nothing to almost 500,000 barrels per annum, and everything points to this figure being very considerably increased in a year or two.

"A necessary adjunct to mining and industry generally is cheap power. Activity in the development of our resources in this respect has kept pace with that in agriculture, mining, and forestry. Since 1921 the total turbine installation in the Dominion has increased from 2,754,000 horse-power to 5,350,000, more than 550,000 horse-power having been installed in 1928. Developments now nearing completion or in active prospect will, on completion, add a further two million horse-power within the next few years; the Beauharnois canal project alone is designed to eventually supply 500,000 horse-power. A total installation of about 43,000,000 horse-power is possible from Canada's water-power resources at present recorded. In the Prairie Provinces where the Department is directly responsible for water-power administration the developed horse-power has nearly trebled since 1921, the progress being most marked in Manitoba where the installed horse-power exceeds 300,000 against 180,000 at the end of 1925. The hydro-electric plants now being constructed under licence from the Department, at the Ghost site on the Bow river in Alberta and at Island Falls on the Churchill river in northern Saskatchewan, will greatly increase the developed power of those provinces, the initial two units when completed at the former site will add 36,000 horse-power to Alberta's present installation of 34,532 horse-power. Working closely with the different provincial governments, stream measurements and basic water-power investigations are undertaken with a view to co-ordinating water-resources data throughout the Dominion.

"Our national forests and timber limits in the Prairie Provinces contain approximately a quarter of the forest resources of the Dominion, and this includes one-third of Canada's pulpwood supplies. Saw-material, ties, cordwood, posts, poles, and so on are all represented. Eighty-seven lumber mills are here in operation, employing 2,300 people, whose output has an annual gross value of five million dollars. A recent development of the forest resources on federal lands has been the establishment of a pulp and paper mill in Manitoba, employing 400 people on full time.

"While furthering the utilization of our forests, we have not been unmindful of the necessity and expediency of perpetuating nature's great gifts of scenic and game resources. Within those lands under the Department's jurisdiction, national parks, game preserves, bird sanctuaries, and shooting grounds have been dedicated to our present and future citizens. A broad policy of road building to link the national parks in the West by motor highways with the United States has been in effect for some time now. It has already borne fruit in that it has placed the parks within reach of a much larger number of our own people and has helped at the same time to greatly increase the number of tourists who come

from south of the International Boundary. Last year, as a result of the intensive development of the Dominion's recreational resources, the tourist trade contributed to the national income a sum estimated at \$276,000,000, which was greater than the value of either our mineral or pulp and paper output over the same period.

"These varied resources demand the most careful attention on the part of the Department in order to ensure that they are not wasted and that they are developed in the national interest. The arable lands must be accurately surveyed in advance of settlement so that no delay or difficulty will confront the incoming settler, and no chance dispute arise over mineral claims. Canada has risen to the high standard which modern conditions demand and has in the middle west the largest continuous area in the world of land surveyed under one system, and that system unsurpassed.

"The resources I have touched upon spell in bold letters the word 'conservation.' Our 22,000,000 acres of national forests and nearly 8,000,000 acres of national parks must be protected from fire and this entails ceaseless vigilance on the part of a body of men—as large as our appropriations will allow—who prevent fires and fight them in the most efficient and modern way, even calling to their aid the aeroplane and the wireless telegraph. I can assure you that no question has received more careful thought than this one of forest conservation, so vital to the interests of every citizen of Canada.

"In regard to the hinterland stretching to the furthest limits of the Arctic archipelago, mineral development is facilitated and the miner and prospector are assisted but the welfare of those whose home these lands have been is not neglected. The Minister of the Interior is charged with the welfare of the Eskimos, and, in his capacity of Superintendent General of Indian Affairs, has the responsibility for the care of the Indians. As a result of the extension of industry into the ancient hunting grounds of the north it has been deemed expedient to introduce measures to protect wild life, not only as an asset in itself—it contributes 15 per cent of the \$19,000,000 the Dominion yearly derives from its fur-bearing animals—but still more because it is a necessity in conserving the health and vigour of the native tribes without whose aid northern development would be impossible. From motives both of humanity and of sound economics the natives of our northland must be given direction and assistance to enable them to meet the inevitable and rapid advance of industry and civilized life into lands where for ages the aboriginal has been left to himself. It is for this that we have built up the herd of ten thousand buffalo near Great Slave lake; that we have sent in experienced Arctic travellers to discover the new route of the migrating caribou, and experts to ascertain whether reindeer will thrive in the Mackenzie valley; that we assist schools and hospitals and send out our own medical men to points in the Arctic that a few years ago were thought to be absolutely inaccessible. These are also the chief reasons for sending out the annual expedition to the Canadian Arctic islands and for maintaining at Bache Peninsula, with the co-operation of the Royal Canadian Mounted Police, the most northerly government post in the world.

"In the Northwest Territories, native copper has long been known to exist near the Arctic coast at Coronation gulf, and this summer an investigation is being made of the resources in the Coppermine River mineral reserve which was created in 1918. Near the southern shores of Great Slave lake private interests are energetically exploring zinc-lead-silver deposits. In the eastern part of these Territories, near Hudson bay, the prospector aided by aeroplane is now reaching inland from Chesterfield inlet in the confident expectation of discovering new metallic wealth in this part of the Pre-Cambrian Shield.

"Adjoining the Northwest Territories to the west is the Yukon, which has yielded more than \$200,000,000 in placer gold from the famed Klondike fields and is now actively engaged in the development of silver-lead ores of such richness that they are being commercially mined and the difficulties of transportation surmounted. The mining of silver-lead ores has been aided by the Department's policy of exempting operators from the payment of royalties until such time as a smelter capable of treating these complex ores has been established in the district.

"So far I have discussed in a very brief manner some of the chief lines of work in those parts of the Dominion for the administration of whose natural resources the Department of the Interior is directly responsible. I could greatly expand this but must now pass on to speak of the investigative and scientific activities of the Department that in a perfectly logical and necessary way grew out of the work for the development of western natural resources, and which to-day minister to the economic advancement of the whole Dominion. I have referred to our system of western land survey. It is admitted on all hands to be one of the most nearly perfect in the world. The feat of laying down such a survey and of subdividing 200,000,000 acres into homesteads was not achieved by accident. It required the use of accurate astronomical observations and out of this necessity grew our Dominion Observatory at Ottawa. The observatory once established, thousands of requests and appeals from all parts of Canada were received for the scientific assistance which only a well-equipped observatory can give. Its work has expanded with the increase of commercial and industrial activity in Canada, and it has been found necessary to assign part of the field of astronomical work to the Dominion Astrophysical Observatory at Victoria in British Columbia. The Geodetic Survey, that organization which determines the exact positions and elevations of selected points throughout the country—points upon which the map structure is built up—is an outgrowth of our original western survey. Now, however, its work is so necessary all over the Dominion that, in order to hasten the running of triangulation and other surveys, construction organizations have contributed substantially to the cost of the work. Likewise it has been found necessary to have the Topographical Survey—which has had much to do with the development of the science of mapping from aerial photographs—prepare and issue standard sets of topographical maps of the Dominion. The International Boundary Commission maintains in a state of effective demarcation our 5,500 miles of international boundaries. The Forest Service not only guards the timber in the forests on Dominion lands in the West but also, at a number of strategic points in Eastern Canada, maintains forest experiment stations where vital problems of reproduction, rate of growth, and the like are solved for the benefit of lumbermen throughout Canada. This is on the side of wood production and on the other side—that of promoting the most efficient and economical utilization—the Department carries on work in three forest products laboratories located in Ottawa, Montreal and Vancouver. An investigatory and information service of the Department has for a number of years been steadily collecting all authentic information available about Canada's resources. It enables the public to obtain promptly unbiased data on the natural wealth of the country and the problems connected with its development. Detailed studies are made to determine what new industries can be developed, along what lines existing industries can be expanded, and what economic use can be made of by-products now wasted.

"LADIES AND GENTLEMEN: My time is now exhausted. I have been able to give you but the barest outline of the work of a Department the activities of which extend from ocean to ocean and from the Great Lakes to the North Pole and cover a multitude of trades, callings and professions. Its responsible officers, during the day we are now closing, have been locating the new settler in his home on the prairies, fighting fires in the forests, measuring waterfalls in the wilderness, facilitating the work of the miner and oil driller, making surveys and maps that touch every farm and mine and community in the country, speeding the tourist on his way, helping the wood-worker and papermaker in their factories, and travelling in cockleshell boats or behind dog teams in our Arctic territory to protect our Eskimo wards and help them to a position of economic independence. And to-night when we are sleeping, astronomers will sit at the eye-pieces of telescopes and search the heavens in the ceaseless effort to discover secrets that will make easier the lot of man upon the earth.

"I hope that this brief address has given you a fuller understanding of the work undertaken by the Department and of its bearing upon the future of Canada, and that you will share with me a healthy pride in present accomplishment and a vigorous optimism for the future."

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GROWING USE OF NATIONAL FOREST SUMMER RESORTS

RECREATIONAL AREAS ARE VERY POPULAR

Policy of Department of the Interior Permits Use of Reserves as Summer Playgrounds

Outdoor recreation is now more than ever recognized as a necessity to modern civilization. The lure of the woods for camping, hunting, and picnicking, and of the streams and lakes for fishing, swimming, and boating is confined to no one class but is felt by rural and urban populations alike. For both classes, and particularly for the former, holidaying in the woods has been facilitated by the development of summer resorts on the National Forests of Canada.

When national forests were set aside by Act of Parliament and placed under the Forest Service of the Department of the Interior, the primary objects sought were: (1) The protection and scientific management of growing timber; (2) the growing of timber on areas suited for that purpose, but of no value for agriculture; (3) the protection of watersheds for the conservation of water supply and the maintenance of streamflow. To these, however, must be added a fourth use, namely, recreation, which has now a permanent place in forestry administration. In the management of national forests, the importance of each use is carefully considered and a plan of administration devised to adjust and harmonize the various utilities so that the largest total of public good may be secured.

Two of the main factors which have led to the development of recreational areas on national forests are the automobile and good roads. By these means the summer resorts are brought within easy reach of thousands of people who visit these areas for periods varying in length from one day to the entire summer season. The site of the summer resort usually suggests itself on account of its natural scenic beauty and potential recreational facilities. Such a location is usually found on a lake which has possibilities for fishing, boating, and bathing, with an adjoining area suitable for picnicking, camping, playgrounds, and ample space for the erection of summer cottages.

The first step in the development of such a summer resort site is a survey by the Department, following which it is carefully laid out, due provision made for the necessary facilities, and

(Continued on page 3)

TRAIL RIDING IN THE ROCKIES

A Most Fascinating Way to Explore our Mountain Playgrounds — Trail Riders Annual Outing

Few more fascinating ways of viewing the scenic wonders of the Canadian national parks are known than by horseback over the numerous trails which lead to the less frequented parts of these vast playgrounds. This method of visiting the outlying parts of the parks, while perfectly safe and comparatively comfortable, appeals to that

nate at the Castle Mountain bungalow camp on the Banff-Windermere road four days later. It has been planned so that it will not be too difficult or arduous for anyone and at a surprisingly low cost. The first day will cover the section from Banff up Healy creek to Simpson pass, which is a delightful and easy ride. On the second day the



Trail Riding in the Rockies—A party of trail riders viewing the magnificent scenery along the Spray River trail in Banff national park, Alberta. Cascade mountain is seen in the background.

spirit of adventure which lies dormant in the most of us, and the rider by being brought intimately in touch with the scenic beauties of the region traversed obtains the maximum of enjoyment. The popularity of trail riding has been greatly increased through the work of the Trail Riders' Club of the Canadian Rockies whose annual outings afford to many people each year an opportunity of seeing some of the very fine mountain scenery not accessible by motor car.

The 1929 "ride" of the Trail Riders will begin on August 1 at Banff in Banff national park, Alberta, and will termi-

Riders will camp on the shores of beautiful Shadow Lake under mount Ball. This day's ride traverses one of the most enchanting and interesting sections of the Canadian Rockies, passing near Egypt, Scarab, Mummy, and Haiduk lakes, all of which can be visited en route and which alone would justify the trip.

Leaving the Shadow Lake camp on the morning of the third day, the Trail Riders will have a comparatively short but interesting ride over a new route to the camp at Twin lakes. Rocky cliffs, glacier hung, rise to a height of

(Continued on page 3)

AIR PROGRAM FOR CIVIL GOVERNMENT SERVICES IN 1929

MANY DEPARTMENTS TO BE SERVED

Royal Canadian Air Force Has Variety of Tasks Planned for Summer Season

Aviation is playing an increasingly important part in revealing, developing, and conserving the natural resources of the Dominion, and each year sees a greater extent of Canada coming under aerial observation for the different services of the Federal Government. The 1929 program of the Department of National Defence, Directorate Civil Government Air Service, for government departments includes—subject to such alterations as subsequent circumstances may necessitate—the following work:—

DEPARTMENT OF THE INTERIOR

Forest Service.—The former area of 3,500,000 acres patrolled in Alberta is increased to 25,500,000 acres. The added area is in the Peace River district where two light planes will operate out from Grande Prairie on detection work only.

In Saskatchewan the work has been reorganized and the planes will cover 21,250,000 acres in the interests of forest protection, both detection and suppression.

In Manitoba over 44,500,000 acres will be patrolled, for both detection and suppression purposes. Here also there is an increase in the area patrolled of about 7,000,000 acres to take care of territory subject to additional hazard through recent mining development.

The photographic work in connection with the survey of the Nelson river watershed is to be completed.

Topographical Survey.—Oblique aerial photography in connection with the study and mapping of the English River, Ignace, and Miminiska Lake areas in Ontario; Manitou, Cross Lake and Granville Lake areas in Manitoba; Reindeer Lake, Foster Lake, Mudjatik River, Fond du Lac and Black Lake areas in Saskatchewan.

Vertical aerial photography in connection with the study and mapping of the Lunenburg and Lake Rossignol areas in Nova Scotia; the Moncton and Newcastle areas in New Brunswick; the Taschereau, Senneterre, Parent, Doucet, Bell River and Maniwaki areas in Quebec; the Lake Nipissing, Algonquin Park, and Rideau Lakes areas in Ontario; Kississing Lake area in Manitoba; Prince Albert area in Saskatchewan; Shuswap Lake area and Parsnip River valley north of Prince George, in British Columbia.

(Continued on page 2)

WAGE WAR FROM AIR ON FOREST INSECTS

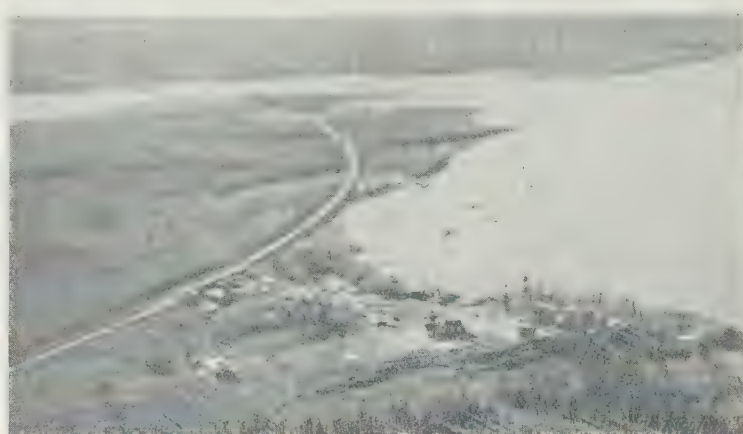
Department of Agriculture Continues Aero-plane Dusting Experiments in Eastern Canada

Entomologists the world over are agreed that insects are collectively the most important menace to humanity on the earth and it is becoming more generally realized that if human beings are to continue to exist they must learn to control these pests. Annually in Canada millions of dollars' worth of damage is done to field and orchard crops, forest and shade trees, stored products, etc., by insects. For a good many years efforts have been put forth to control these pests, one of the chief agencies in the campaign being the Entomological Branch of the Department of Agriculture.

A division of the work of growing importance to Canada is that engaged in the suppression of forest insect pests. The Forest Insects Division of the Entomological Branch in co-operation with the Royal Canadian Air Force has been endeavouring for some time to provide a method for controlling outbreaks of defoliating insects, which destroy such vast areas of forest, by distributing poison dust by aeroplane over the infested areas. In co-operation with the Dominion and Provincial Forest Services they are also engaged in working out permanent methods of prevention and control through forest management and improved methods of handling timber. In cases of great outbreaks of defoliating insects such as the spruce budworm or hemlock looper, while methods of management will provide immunity, some swift method of direct control is necessary and aeroplane dusting is at present the only hope.

During the summer of 1927 the Forest Insects Division in co-operation with the Air Force and the Dominion and Nova Scotia Forest Services carried out experimental dusting operations with calcium arsenate in Cape Breton island and Antigonish county in Nova Scotia. The experience gained in that experiment justified a continuation in 1928 and severe infestations of spruce budworm in northern Ontario were attacked under conditions more favourable for such experimental work. In both seasons a large number of relatively small plots were treated. Information of much value was secured and the work will be continued in northern Ontario this year on a larger scale. The operations will be under the direction of the Forest Insects Division and the Air Force will provide a large triple engine plane equipped for distributing the poison dust. The Ontario Forest Service will supply the dust and will otherwise assist in carrying out the campaign. It is proposed to dust several areas between half a mile and a mile wide using poison of several different degrees of strength, and it is hoped to obtain from this season's operations definite data on the effect of this method on a commercial scale and the cost of the operations under such conditions. The experiment will be conducted during the last

*Prepared at the direction of Dr. J. H. Grisdale, Deputy Minister, Department of Agriculture, Canada, by Dr. J. M. Swaine, Associate Dominion Entomologist.



1929 Air Program—Aerial view of the Cormorant Lake air base northeast of The Pas in northern Manitoba. Important aerial work will be carried on from this point during the coming season. At the left is a section of the Hudson Bay railway now rapidly nearing completion.

AIR PROGRAM FOR CIVIL GOVERNMENT SERVICES IN 1929 (Continued from page 1)

National Parks of Canada.—Oblique aerial illustrative views of sites of historic interest when other operations permit. If planes are available the photography of areas between the Big Bend of the Columbia river in British Columbia and the Canadian National railway. Continuation of the practice of co-operating with the Forestry Branch in the patrol of the Waterton Lakes park from High River base.

Natural Resources Intelligence Service.—The taking of oblique scenic photographs illustrating features of all kinds—settlements, power plants and sites, lumber and mineral developments, industrial plants, etc.—relating to the development of the natural resources of Canada.

Dominion Water Power and Reclamation Service.—Vertical and oblique photography in connection with power

two weeks in June and the first week in July.

In the Muskoka region of Ontario during the last three seasons extensive injury has been done to hemlock stands by defoliating insects. The Ontario Government Forest Service will provide a specially equipped plane and the necessary dusting material for control operations in co-operation with the Forest Insects Division.

The Division will, during the coming summer, investigate extensive outbreaks of hemlock looper in stands of balsam fir pulpwood on the north shore of the St. Lawrence river below the Saguenay. This is the same insect which is causing so much damage to hemlock in the Muskoka region.

Experimental dustings which have been carried out by the Division of Forest Insects working in co-operation with the Nova Scotia Forestry Branch in 1927 and the Ontario Forestry Service in 1928 indicate that when certain practical difficulties incident to the application of the poison dust have been overcome, small outbreaks of insects may be checked by this method before they have reached the epidemic stage in which they cause such tremendous forest damage. Once these outbreaks have gained full momentum, however, artificial control is almost if not quite impossible. It is also considered at present that the cost of aeroplane dusting would prohibit the use of this method on a very extensive scale but that the present method will prove practicable and of use commercially for the protection of the more valuable stands of pulpwood when threatened with infestation.

projects in New Brunswick, Quebec, Ontario, Manitoba, and British Columbia, including vertical photography of areas adjacent to the Winnipeg, Nelson, and Churchill rivers, and Rottenstone lake.

Geodetic Survey.—Reconnaissance flights along the Canadian National railway from Senneterre to Barriere on lake Kakabonga, from Clave to near La Tuque, and from the vicinity of Folyet to Nakina; on the Canadian Pacific railway from Sudbury to Sault Ste. Marie.

North West Territories and Yukon Branch.—Provided planes are available, aerial photography over a number of different areas in the Northwest Territories.

DEPARTMENT OF MINES

In co-operation with the Topographical Survey, Department of the Interior, vertical aerial photography to complete work started last year in areas in Cape Breton island, Nova Scotia; in New Brunswick; and in Manitoba, together with a small operation in the Rottenstone Lake area.

DEPARTMENT OF PUBLIC WORKS

To assist in dredging and other operations in Kootenay district of British Columbia. Vertical photographs have already been taken in the vicinity of Arrow lakes and Kootenay lake.

An area also in the vicinity of Prescott is being photographed in connection with port development. It may be mentioned that vertical aerial photographs reveal underwater features which assist in laying out such projects.

DEPARTMENT OF AGRICULTURE

Experimental dusting for the prevention of wheat rust in the Prairie Provinces, and for the control of the spruce budworm in the Sudbury district. In co-operation with the Ontario Government Air Service, the control of hemlock looper in Muskoka district.

PROVINCIAL SERVICES

In addition to the work of the Royal Canadian Air Force, extensive programs are being carried out by provincial governments and private interests. The province of Ontario operates its own Forestry flying service and during the period of fire hazard, detection and suppression patrols are carried on throughout northern Ontario. Forest type sketching is also carried out on a large scale, as well as exploration in the district of Patricia. This work each year, on account of mining and other developments, is being extended farther and farther north.

In Quebec and British Columbia the work is undertaken by commercial companies, under contract, for the respective provincial governments. Much transportation of survey parties on the north shore of the Gulf of St. Lawrence is done by aircraft. A large part of

BUILDING A MOTOR ROAD THROUGH THE ROCKIES

Difficulties Overcome by National Parks Engineers Constructing Kickinghorse Trail

Travelling over the Kickinghorse Trail from Field in Yoho national park to Golden, British Columbia, one may not realize the difficulties experienced by the engineers of the National Parks of Canada Branch of the Department of the Interior in its construction. The last section alone took three years to build as its high elevation and peculiar situation offered many special obstacles. The removal of debris required the greatest of care on account of the railway tracks below. A rock dropped down the valley side might break a rail and wreck an on-coming express. Cribbing was another problem not easily solved. Towards the western end the nearest suitable timber grew on the mountain top above and the logs could not be rolled over the edge because they were wanted half way down. Therefore, the required timber—about 600,000 linear feet—had to be let down 1,200 feet by cable and drum. Dynamiting operations, too, were unusually difficult. Where rock excavations were necessary a man was let down over the side of a cliff and hanging suspended at the end of a fifty-foot rope he bored a hole into the mountain for a shot, lit the fuse, and then signalled to his companions at the top to haul away. In spite of these engineering difficulties, the section was completed without serious accident of any kind.

Gaspe has now been photographed. Air patrols for forest fire protection will be continued in British Columbia.

COMMERCIAL SERVICES

At the present time there are 44 commercial operating companies in Canada. Their activities extend into all parts of the Dominion and include forest fire patrols, timber cruising, air photography, passenger, express and mail transportation, instruction, and other related services.

Valley of a Thousand Falls

The name Valley of a Thousand Falls in the Mount Robson district, British Columbia, was bestowed by the Rev. G. B. Kinney, who first visited the region with Dr. A. P. Coleman and participated in his attempt to climb mount Robson.

The Columbia Ice-Field

The melting waters from the Columbia ice-field in Jasper national park, Alberta, feed the sources of three of the largest and most historic rivers in the Canadian West—the Athabaska, the Saskatchewan, and the Columbia, which flow to three separate oceans.

Naming Our Highways

Continued progress has been made in the naming and numbering of motor roads in Canada and in the erection of uniform direction and warning signs and danger signals. Interprovincial conferences have been held for the purpose of standardizing signs, signals, and other highway devices throughout the Dominion.

Use of Power per Capita

The steady increase in the use of power per capita in Canada is shown by a comparison of the figures for 1920 and 1927. During this period the amount of power used per 100 of population increased from 43 to 63 horsepower, or the use of power per inhabitant increased over 46 per cent.

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OTTAWA, JUNE, 1929

GROWING USE OF NATIONAL FOREST SUMMER RESORTS

(Continued from page 1)

such measures taken as are deemed necessary for the sanitary regulation of the resort. In the larger summer resorts, a forest officer is placed in charge, whose duty it is to maintain contact with all the users, and at the same time exercise close supervision of the recreational area.

Already many permanent summer homes have been erected in the resorts and these are occupied for the entire summer season by families from the towns and villages adjacent to the national forest. Lots for the erection of these cottages are obtained on an annual permit and there is a nominal rental fee. The building restrictions are such as to require a cottage of a fixed minimum value in keeping with the general standard of the resort.

Fifteen summer resorts have now been established on ten of the national forests. Two of these resorts are located in the Railway Belt of British Columbia, while thirteen are situated in the prairie section of the provinces of Manitoba, Saskatchewan, and Alberta. Each year sees an increasing use of summer resorts on national forests by the public and a more active participation in this new phase of forest administration by the Forest Service, Department of the Interior, which includes the stocking of the lakes with fish, added improvements to roads and facilities in and surrounding the immediate area, and a general increase of supervision.

Recreation on national forests is not restricted to the summer resort areas, since there have already been constructed for administrative uses, such as fire protection, thousands of miles of roads and trails. While only a few of the roads are of the all-weather standard, the majority are quite suitable for motor traffic during the summer season. Many of these lead to lakes and streams where camping, picnicking, and fishing are permitted.

The general development of national forests is being assisted by their recreational use since the presence of campers and summer-home permittees in considerable numbers tends to make evident to an increasing proportion of

MARKED DEVELOPMENT ON DOMINION LANDS

Great Activity in Settlement and in Search for Minerals—Figures Compiled in
Department of the Interior

Figures compiled in the Department of the Interior show in a marked degree the wonderful development taking place in Western Canada. This development is not confined to agriculture which has recorded a tremendous advance. In mining great activity has been noted especially in the quartz and petroleum fields. One of the most striking developments is in land settlement. Canada's agricultural progress during recent years has been remarkable and its present satisfactory state is evidenced by the increasing demand for land for settlement in the western provinces. Vast areas of fertile land constitute the Dominion's greatest single resource and the economic stability of our leading industry is reflected in the rapid opening up and settlement of the West. During the fiscal year ended March 31, 1929, the increase in the number of homesteads and soldier grants taken up was very great, close to two and three-quarter million acres being filed on during the twelve-month period. This was more than double the area taken up during the previous fiscal year.

A total of 16,157 homesteads and 742 soldier grants was taken up during the twelve months ending March 31, 1929, as compared with 7,233 homesteads and 504 soldier grants in the preceding fiscal period. The 1929 entries covered a total area of 2,703,840 acres as against 1,237,920 acres in 1928. The remarkable increase in the year just closed is in part due to an amendment to the Dominion Lands Act passed last June permitting a settler who had completed his duties on his first homestead on or before January 1, 1925, to take up an additional 160 acres as a second homestead. Since June last year 4,691 homesteaders took advantage of this new regulation, the total area of land involved being 750,560 acres.

A significant feature of land settlement in Western Canada is the northward trend of this development. The more northerly agencies are Peace River, Grande Prairie, Edmonton, and Prince Albert. Peace River and Grande Prairie handle the entries for Dominion Lands in British Columbia and for northwestern Alberta. Edmonton deals with northern Alberta, and Prince Albert with the northern parts of Saskatchewan.

The following table shows the increase in the fiscal year 1928-29 as compared with the previous twelve months and also the large number of entries made through the northern agencies.

Agency	1928-29	1927-28
Winnipeg, Man.	327	409
Dauphin, Man.	344	314
Moose Jaw, Sask.	1,704	1,205
Prince Albert, Sask.	4,353	2,162
Lethbridge, Alta.	301	139
Calgary, Alta.	579	203
Edmonton, Alta.	3,789	1,540
Peace River, Alta.		
Entries in Alta.	2,666	863
Entries in B.C.	344	42
Grande Prairie, Alta.		
Entries in Alta.	2,011	882
Entries in B.C.	376	75
Revelstoke, B.C.	22	28
Kamloops, B. C.	26	38
New Westminster, B. C.	57	17

Totals. 16,899 7,737

Activity in the search for minerals on Dominion lands in Western Canada has been great and during the fiscal

the general public the aims and objects of forest administration, the problems involved, and the part which the average citizen can play in their solution.

year just closed approached record proportions. The principal metallic minerals produced in these areas are gold, silver, copper, and lead. The non-metallic minerals are coal, petroleum, natural gas, clay, building materials, mineral salts and associated marls. During the twelve months ending March 31, 1929, a total of 8,549 grants was issued for quartz and placer claims which was considerably in excess of the 4,548 issued last year. A substantial increase in the number of petroleum and natural gas leases is also noted, the comparative figures for the last two fiscal years being: 1928-29, 1,732; 1927-28, 1,603.

Since the close of the past fiscal year the flow of settlers to Western Canada and the activity in the mining industry have continued. Development on Dominion lands is proceeding in a steady, healthy manner and the present movement has already made itself felt in the agricultural and commercial life of the West.

TRAIL RIDING IN THE ROCKIES

(Continued from page 1)

8,500 feet on each side of the narrow valley to be traversed, while the abrupt eastern slopes of peaks like Stanley, Vermilion, and Haffner will be revealed for the first time to the Riders as they pass through this section.

The Twin Lakes camp, where the Riders will spend the third night, nestles under the precipitous slope of Storm Mountain. Its eastern face, with its sheer cliffs, and stately chimneys and pinnacles, towers over 3,500 feet above the camp plateau. It is from the cloud banks and shadows which almost continually hover around the upper peaks that the mountain receives its name.

The fourth and last day of the ride will take the party to the Castle Mountain bungalow camp on the Banff-Windermere road about five miles west of Castle Mountain station on the Canadian Pacific railway. First-class accommodation can be secured here, comfortable cabins being available for those who desire to stay through the night or longer. The interesting Pow-wow and Sing-song of the Trail Riders club will be held early in the evening of the fourth day at the camp and ample time will remain after its conclusion to permit those who wish to return to Banff or to go to Lake Louise to do so.

Engineers of the National Parks of Canada, Department of the Interior, assisted officers of the Trail Riders' Club in determining the feasibility of this route for the annual ride. All those taking part in this ride must provide their own sleeping equipment, preferably eiderdown sleeping bags or three or four warm woollen blankets. Nights in the mountains at altitudes of 7,500 feet and over are always cool, no matter how warm the days. This trip will count as a 50-mile ride and will entitle beginners who make it to wear the bronze button, emblematic of the first degree of the Trail Riders.

Canada Ranks Third

Canada ranks third in importance as a source of metals of the platinum group, after Russia and Colombia.

CHURCHILL RECEIVED ITS NAME IN 1686

Terminus of Hudson Bay Railway Has
Been Known by Other Names

Churchill, the terminus of the Hudson Bay railway at the mouth of Churchill river, first appears on a map in the collection of the Geographic Board of Canada as "Port de Munk." The map is that of the French map-maker Sanson published in 1650. The reference is to Jens Munk, the Danish naval officer who wintered there in 1619-20 with the loss of all the members of his crew except himself and three others. The tragedy so impressed the natives that they called the river *Manoteou sibi* or Strangers' river. Hence also the name Danish river used during the French regime on Hudson bay. Both names are mentioned by the Canadian, Jeremie, who resided twenty years on the bay and published an account of it in 1720. Seven years before Munk landed at Churchill, Sir Thomas Button had sailed down the coast and Captain Luke Foxe's map of 1635 applies one of Button's names "Hou-bart's Hope" to Churchill bay. The oldest Indian name of the river is *Missinipi* or Big river, a name that is found in the York Factory journal for 1714. The river received another name in 1775, when Joseph Frobisher from Montreal reached its upper waters and intercepted Indians bound with furs for the "English" post (Churchill) on the bay and called it English river.

The application of the name Churchill is due to the Hudson's Bay Company, for whom Captain John Abraham established a post in 1686, naming post and river after John, Lord Churchill, afterwards Duke of Marlborough, who had been elected Governor of the company in the previous year. The post was destroyed by fire about 1689 and because of wars with France which lasted till 1713, Churchill was not visited again by the company until 1717, when Governor Knight proceeded to it from York Factory and chose a site for a new post.

OIL PRODUCTION IN ALBERTA FOR MONTH OF MARCH, 1929

Output of Wells Reached 61,561 Barrels—Comparison With Same Month in 1928

The production of petroleum in Alberta during the month of March, 1929, reached 61,561 barrels according to the statement compiled in the Department of the Interior from the reports of operators. The figures for the different grades and the comparative totals for March, 1928, are as follows:—

	Naphtha 60° or higher (brls.)	Light Crude 30°—60° (brls.)	Heavy Crude 30° or lower (brls.)	Total (brls.)
March, 1929. . .	55,112	5,243	1,206	61,561
March, 1928. . .	32,485	5,414	942	38,841

Canada's Forest Products

One freight car in every six in Canada is loaded with forest products.

Rayon from Wood

Few people realize that rayon or artificial silk made by the viscose process is pure cellulose of wood fibres.

ERECT ADDITION TO ORE TESTING LABORATORIES

Department of Mines Extends Co-operation in Research to Iron and Steel Industry

In view of the growing importance of the iron and steel industry in Canada, the Department of Mines is providing laboratory facilities for test and research, thereby extending to that industry the same degree of co-operation that has proved so advantageous to the non-ferrous mining industry. The Department has erected in Ottawa as an addition to its present Ore Testing Laboratories, a new pyrometallurgical laboratory, which is being equipped with laboratory scale and semi-commercial roasting, calcining, sintering, metallizing, melting, heat-treating, and standard laboratory testing and metallographic equipment for conducting extensive test and research on ferrous and non-ferrous ores, metals and their alloys, especially iron and steel.

At the time the Mines Branch was organized into its various Divisions in 1907, the most pressing problem confronting the Division of Ore Dressing and Metallurgy was the beneficiation of Canadian iron ores and consequently the first laboratory to be built was equipped for beneficiation tests. Twenty-one ores from Nova Scotia, New Brunswick, Quebec, Ontario, and British Columbia were tested, the results showing that in many cases marketable products could be obtained, suitable for use in the iron blast furnaces. However, the work was not productive of establishing an iron ore industry as primary ores could be imported and laid down at Canadian furnaces at less cost than Canadian beneficiated ores.

During the war and post-war years, very little investigative work was done by the Mines Branch on iron ores or on any phase of ferrous metallurgy. This lack of attention may be attributed to two causes: First, there appeared to be no hope for the immediate utilization of Canadian iron ores due to the ready availability of cheaper imported ores; and second, to the demands for ore treatment test and research by the rapidly growing non-ferrous industry, stimulated by the urgency for the production of war metals. The investigative work of the Division of Ore Dressing and Metallurgy was therefore directed to the treatment of non-ferrous ores. Nevertheless the laboratory equipment for the beneficiation of iron ores has been kept up-to-date by the purchase from time to time of new equipment as progress has been made in other countries. Developments have been closely watched for their application to Canadian ores.

No large deposits of primary iron ores are available for use in blast furnaces are known in Canada, hence, she has to rely on imported ores to supply her requirements. The two chief sources are the United States for Ontario, and Newfoundland for Nova Scotia furnaces. However, located within reasonable distances of her furnaces are large deposits of the following types, all of which require beneficiation or some special method of treatment for their utilization; siderites or iron carbonates; low-grade, low sulphur magnet-

*Prepared from material supplied by the Department of Mines.

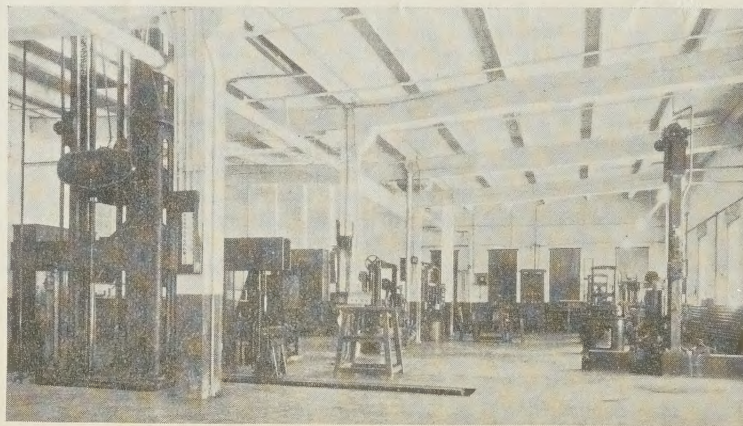
FOREST PRODUCTS RESEARCH

Its Importance in Expansion of Canadian Trade—Work of Department of the Interior Laboratories

The close affinity of the expansion of Canadian trade and scientific research is not generally apparent at first glance but a review of the results of a few of the many investigations carried out by the Forest Products Laboratories of the Forest Service, Department of the Interior, will make this clear. For example, for years it has been regarded as absolutely necessary

foreign woods for the manufacture of top pins, and with eastern Canada's extensive resources in these hardwoods, the development of an export trade is possible.

In one of the earliest investigations the Laboratories demonstrated that Douglas fir was particularly suited for structural work, and additional tests will be completed shortly which will



Forest Products Research—General view of the mechanical testing laboratory of the Forest Products Laboratories, Department of the Interior, at Ottawa. In the left foreground is the 200,000-pound hydraulic testing machine, the only one in Canada, used for determining the comparative strengths of different kinds of Canadian timber.

that the top pins of telephone pole cross-arms should be made of imported wood because it was supposed that no Canadian wood could be found to answer the purpose. The Forest Products Laboratories, however, by exhaustive experiments proved that Canadian birch, beech, and maple when treated with creosote, or other preservative, were equal, if not superior to the imported woods. Consequently these Canadian woods are now replacing the

ites; high-sulphur magnetites; magnetite-hematite mixtures; titaniferous magnetites.

It is felt that the time is approaching when it will be economically possible to utilize Canadian ores to supply Canadian furnace requirements and the iron and steel industry with products of Canadian origin. The annually increasing percentage of ores being beneficiated in other countries together with the developments in the technique of beneficiation processes and the vast amount of experimental work being done on direct reduction processes in the past few years have brought closer the time when Canadian ores can be utilized. It is believed that mixtures of Canadian beneficiated ores in the proper proportion will give grades of pig iron more adaptable to the production of diversified iron and steel products. It is therefore the purpose of the Division of Ore Dressing and Metallurgy to investigate the beneficiation of Canadian ores of the foregoing types and also their adaptability to direct reduction or sponge iron processes.

In addition to the above, current developments in processes for the direct reduction of iron ores, and for the manufacture of alloy steels, both subjects of interest to the iron and steel industry of Canada, are also being closely watched by the Mines Branch metallurgists.

indicate the effect of commercial creosoting on this timber. In their tests for the Air Force of Canada, of which they conduct some 600 yearly, the Laboratories demonstrated that certain Canadian woods are ideal for aeroplanes. The possibility of using Canadian woods in place of walnut for gunstocks has also been investigated and the results have been forwarded by special request to Europe, while at the same time information on the suitability of Canadian woods for pick and shovel handles has been sent to the Canadian Trade Commissioner in England.

The number of investigations under way is very large. In one division alone, that of Timber Mechanics, about 16,000 individual tests were made during last year. These tests related to treated and untreated woods for railway ties; crates for the shipment of merchandise; reinforced and unreinforced butter and cheese boxes; telegraph, telephone, and electric light poles; cross-arms and top pins; wood for insulating purposes in refrigerator cars; relative strength of different Canadian glues and glued joints; the nail-holding capacities of different woods; and many other features affecting the wood manufacturing and structural trades of Canada.

One very interesting test which will probably result in the further economic use of Canadian trees as telephone poles is under way. Poles of untreated red pine, cedar, and the once despised jack pine, together with creosoted red pine and jack pine poles have been collected and are now being conditioned on the premises. This conditioning is necessary in order to bring the poles before strength tests are made, to the same condition as poles in service; that is with butts in the green condition and the major portion of the pole, which stands above the ground, air-seasoned. This was accomplished by standing the poles in an open air pit

MAPPING MOUNTAINOUS AREAS WITH A CAMERA

Present Day Topographic Surveyor Must Also be a Mountain Climber

In mapping the Dominion's mountainous districts, the surveyor of to-day must of necessity be something more than a surveyor only. He must be a mountain climber as well. In the broken areas of Western Canada, where elevations vary from foot-hills to peaks 11,000 feet or more above sea-level, surveys for mapping purposes by the regular methods as used in level or nearly level country are practically impossible except for limited areas, and almost prohibitive owing to excessive cost. Some cheaper and more practical method of survey had to be discovered. Thus it was that, as early as 1886, Canada adopted and improved the system of photographic surveying for such regions.

In making use of this method it is necessary that all the portions of the areas to be surveyed must be seen from at least two points and photographs taken therefrom to cover the complete circuit of the horizon. In other words every detail must be covered in at least two views. This means that, for mapping a mountainous area, many peaks must be climbed by the surveyor with his transit and camera, and the position and elevation of each established.

While taking the photographs the surveyor also observes certain prominent peaks or points which he considers will afterwards be easily identified in the photographs. At the same time he may ascertain the angle of elevation or depression of these points and carry on triangulation.

One survey party in Jasper national park in the season just past climbed 29 peaks in the course of their duties. Of these 12 were over 10,000 feet above sea-level, including Nigel peak (10,525 feet), Sunwapta peak (10,865 feet), and Poboktan peak (about 10,980 feet), and 36 others were over 9,000 feet above sea-level.

six feet deep filled with water. The result of these strength tests, under conditions approximating actual use will be to show, as indicated by the data already secured, that some of the woods hitherto considered unsuitable for this purpose are fitted to take the place of the more expensive woods, or to be largely used in conjunction with them.

Thus it will be seen that research work in regard to the properties of our native woods is in addition to finding uses for timbers formerly regarded as of little or no value, demonstrating the superiority of many of our native woods as compared with those imported, and is thus increasing the domestic and export trade in Canadian forest products.

Tourists Aid Development

The tourist is often the forerunner of the homemaker and investor. He visits the country and sees with his own eyes the character of its people and resources, and if he later returns to settle or invest he is able to do both in a more satisfactory manner.

First Separator Came in 1882

The first centrifugal cream separator was imported into Canada from Denmark in 1882.

